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NEWTEKNIQUES

October/November 1998
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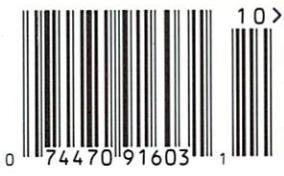
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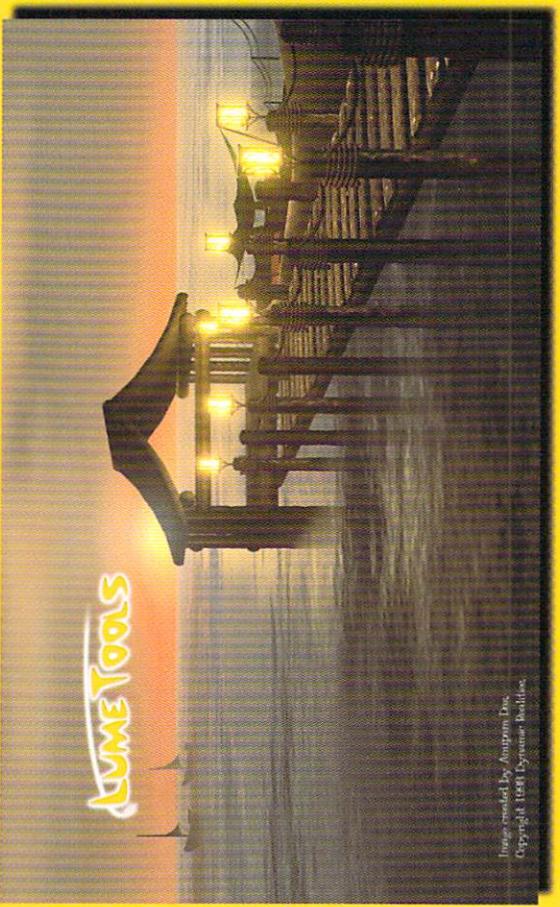


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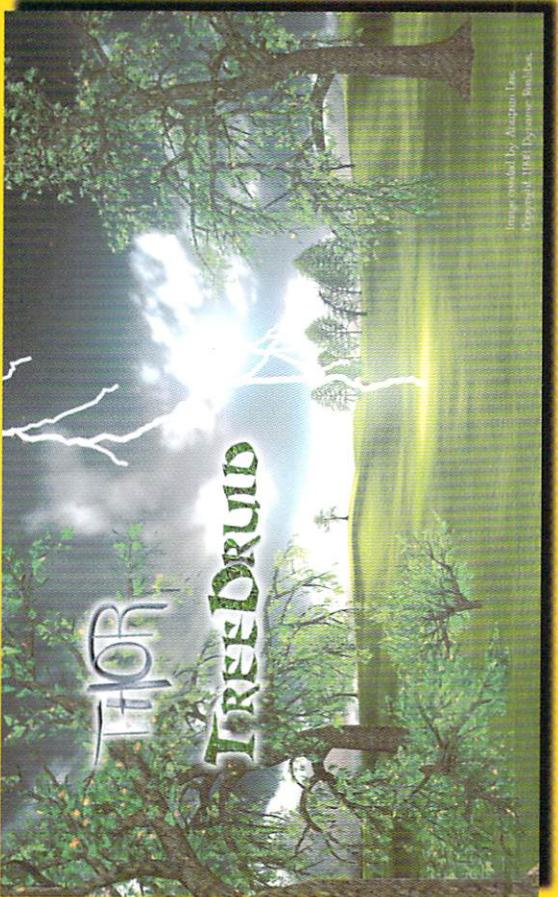


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NewTekNIQUES

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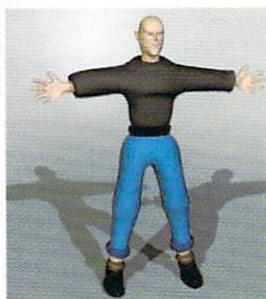
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ON THE COVER:

This issue's cover was designed by Station X Studios AristoMenis Tsirbas. If the name sounds familiar, it is because he designed the cover for the premiere issue of *NewTekNIQUES* in April 1997. The spider cover was created for the announcement of Station X Studios first plug-in (page 14).

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TekTALK

OUR EDITOR'S OPINIONS ON IMPORTANT NEWTEK ISSUES

BY JOE TRACY

It's time to issue a report card on NewTek's 1998 performance.

Did NewTek Make the Grade? NEWTEK REPORT CARD 1998!

With the year drawing to a close, it is a good time to release a report card on NewTek's performance. Like all report cards, grades are given in several different subjects. In this case, however, the grades are awarded based on my observations throughout the year. Be sure to check out the bonus area online where you can rate NewTek, too!

Customer Service

Throughout the years, NewTek has struggled with customer service. This year, NewTek sought to change that reputation by putting Chuck Baker in charge of the program. Good move! Whereas I used to be put on hold for what seemed like an eternity, I've been pleasantly surprised recently when my calls to customer service were answered within two minutes! Furthermore, the people on the other end of the line were very polite and extremely helpful. Since grading is based on the year, versus since the changes have been implemented, I award NewTek a solid B.

Dealers/Partners

If there is one area where NewTek needs a lot of improvement, relationships with partners and dealers is it. Unfortunately, NewTek performed poorly in this category this year. Every time I talk to authorized NewTek dealers, I hear quite a few complaints about NewTek service. NewTek needs to put a stronger emphasis on nurturing relationships with dealers and partners. When such is done, the rewards will be great. For this year, however, NewTek receives a D.

Research and Development

In both LightWave 3D and the top-secret sixth floor at NewTek's headquarters, you will find some of the brightest minds in the industry. NewTek has one of the best research teams at both locations that I've ever seen and I have no doubt that future product releases will be a testament to this. Furthermore, Tim Jenison is, simply put, a genius. Few in the industry

can top his knowledge. This grade is an easy one to give—A+.

Product Releases and Updates

The release of Aura, LightWave 5.6 (free upgrade), and Inspire 3D were great moves this year for NewTek. Aura, in particular, looks very promising. Even with such great products, a major upgrade to LightWave has been a long time coming and Flyer owners have seen practically nothing in more than two years. There's also word that some products get close to release (like the Flyer daughter card), but never quite make it and end up getting passed over for other projects for unknown reasons. This is frustrating for those so dependent on such great products. When all is said and done for this category, NewTek gets a B.

Technical Support

Another easy one, thanks in part to Chuck Baker and his dedicated team: solid A

Web Site

The look is much improved and updates are coming quicker than last year. The support FAQs are an excellent resource. B+.

While there's room for improvement in some areas, NewTek is excelling in others. Maybe next year changes will be put into place to raise that G.P.A. to 4.0. The potential is surely there!

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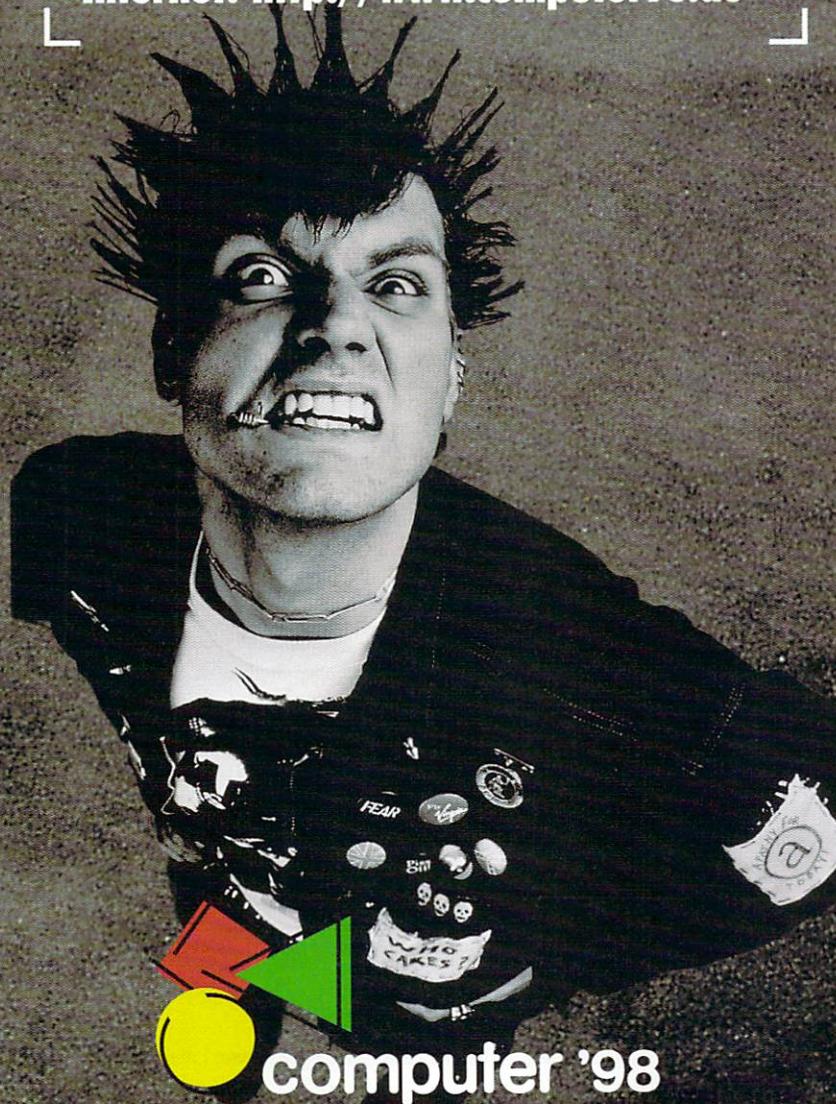
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Plugged In

LIGHTWAVE ADVANCEMENTS THROUGH PLUG-IN SCRIPT WRITING



You can access the LScript mailing list on the LightWave Outpost Web site at www.lightwaveoutpost.com.

BY BOB HOOD

INQUIRING MINDS WANT TO KNOW

I would hope that up to now you've been able to learn a bit more about LScript than perhaps you may have known, or you've gotten somewhat of an introduction to this powerful tool. In this installment, I will focus directly on some questions and problems that have recently come my way. Although I have not yet covered anything specific to Layout LScripting, topics may not be restricted only to Modeler LScript.

As happens with time, things change. Here then are some of the developments that have taken place since last time:

- 1) The folks at the LightWave

Outpost office in downtown San Francisco, CA, have launched their own LightWave-related Web site. You can visit this LightWave Outpost Web site at [\[waveoutpost.com\]\(http://www.outpost.com\). This site contains several areas of interest to LightWave developers, including mailing lists and plug-in developer support pages. Some staff-related Web pages are also accessible from this site.](http://www.light-</p></div><div data-bbox=)

2) A new mailing list has been established strictly for LScript developers. You can get subscription information about this mailing list by visiting the LightWave Outpost Web site.

3) Due to a recent change in ISPs, I have relocated most of the LightWave-related content of my own personal Web site (formerly found at www.flash.net/~bhood2) to the LightWave Outpost Web site staff pages.

Now, on with the show.

Inquiring Minds

Question: "Why is LScript so C-like?"

Answer: I realize that this ques-

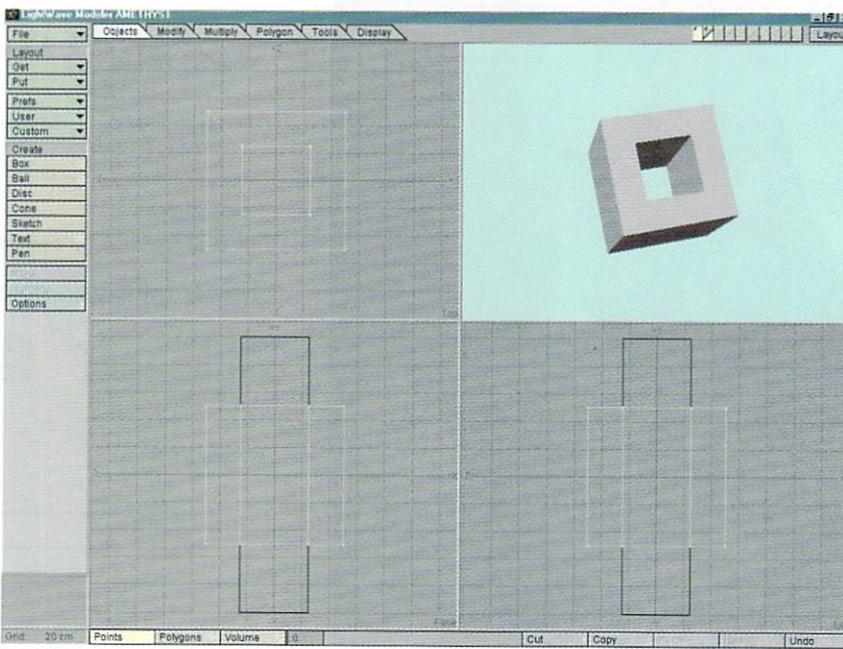


Figure 1: Object Creation and CSG Operations controlled via LScript.

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tion is more philosophical than technical, but it has been asked of me quite a lot, and it is a good question with which to start.

I actually had a conscious design behind going with a C-like syntax for LScript, as opposed to basing it upon the characteristics of other languages like BASIC or Pascal or Smalltalk, or even other scripting languages like HyperCard. C and C++ are the current industry standards in software development (this is not an arguable issue, folks; it's a fact), and LScript is modeled after this standard for several reasons. For instance, it is meant to provide a solid migration path to and from LightWave's lower-level plug-in development tools. Also, it offers LightWave plug-in developers a means of performing rapid prototyping of ideas in a language that they are either already familiar, or one for which someone with more expertise could readily be located.

However, LScript is not C. LScript provides enough underlying power—with its advanced data handling and encapsulated functionality—to probably qualify as a Fourth-Generation Language (4GL), whereas C is considered a 3GL. Going from C to LScript is comparatively easy, especially since the two languages are so similar; going the other direction can prove much more difficult.

Question: "I tried saving user-selected point identifiers so that I could use them to select the same points again later in my Modeler script. However, when I tried to use them again on the same model, they wouldn't work. Why?"

Answer: Point and polygon identifiers in Modeler are highly volatile. These values are not guaranteed to remain the same between Modeler sessions—indeed, sometimes they won't even be the same between invocations of editbegin() in the same script. In the current LightWave Modeler there is no intrinsic means of permanently identifying points and polygons.

To my knowledge, there is no foolproof solution to this problem—it requires some direct changes to the way Modeler handles these elements. A semi-constant that you might be able to employ would be point or polygon

order, but not knowing the internals of how Modeler manages things like this leaves even this open to awkwardness. Such a solution could likely be rendered ineffective if the mesh were edited between the point where you remembered the point/polygon order, and the next time you attempted to use that information to reselect.

Question: "I'm confused about variable lifetimes. When are certain variables created, and how long do they live?"

Answer: There are two types of variables in LScript: local (or auto, in C parlance) and global. Local variables are created by user-defined functions (UDFs), and belong solely to these entities. They are visible only to code within the UDF that declares them, and cannot be accessed by any code external to it. As a side effect of this, it is possible to have two or more variables with the same name but with different values in an LScript because each was declared-initialized by a different UDF.

```
...
cutIt
{
    distance = 15.934;
...
}

ripIt
{
    // 'distance' will be 'nil'
    if(distance == 15.934)
    ...
}
```

Local variables will cease to exist when a UDF completes, and are created again from scratch when the UDF is again invoked.

Global variables, on the other hand, are owned by LScript itself, being declared-initialized outside of any UDFs. Globals can be seen and/or modified by any script code, and the changes will be instantly visible to any other script code.

```
distance = 10.0;
...
cutIt
{
    distance = 15.934;
...
}

ripIt
{
    // 'distance' will be either
    // 10.0 or 15.934 depending
    // upon who is called first

    if(distance == 15.934)
    ...
}
```

Question: "I have an LScript that works well, but is a bit too slow. Would converting it into a [C code] plug-in make it faster, and how hard would such a conversion be?"

Answer: To answer the first part of the question, yes, it would without doubt be faster. While it may come close in some cases, interpreted code will never be as fast as native (binary) code. If there is some script functionality for which speed is critical, you should consider converting the working script into C code.

As for the second part, any answer I could give would be subjective. The difficulty involved with converting LScript to C code relates largely to the expertise of the one performing the conversion, as well as their familiarity with the underlying LightWave plug-in API. I have done some preliminary work with regard to aiding such conversions (see my InYourFace utility, a converter of LScript requester interface script code into C code that duplicates the requester using LW Panels, available from my staff page on the LightWave Outpost Web site), but there is no single solution to conversion. The answer to this can only come from experience.

Question: "My Modeler script is using the processing monitor feature, but it doesn't display all the time. Is it buggy?"

JOE TRACY'S Flyer Mastery Guide

Version 2.0

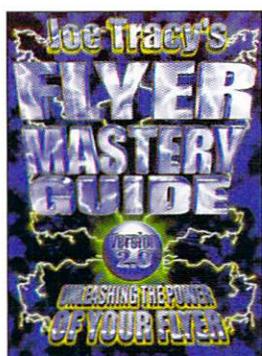
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Answer: The Modeler processing monitor will not necessarily appear just because you've initialized it. It doesn't work that way. Modeler only posts the status monitor if a plug-in or process takes longer than some internal delay factor to perform its processing. If your script (or plug-in) performs its processing (between the moninit() and monend() calls) in less time than Modeler's internal timeout value, then you will never see the monitor.

The following short Modeler LScript forces the monitor to display by inserting a deliberate delay factor into each iteration of the "processing" loop:

```
main
{
    moninit(10,
    "Forcing Monitor");

    for(x = 1;x <= 10;x++)
    {
        sleep(1000);
        monstep();
    }

    monend();
}
```

Question: "The lyrfg() command is supposed to return an integer, but it looks more like an integer array. Is there a way to have an existing array filled up correctly with values returned from lyrfg ()?"

Answer: Of course, if you assign multiple return values to a single variable, LScript will automatically generate an array for storing the values so that nothing is inadvertently lost.

If you have an existing array that you would like to use instead, the assignment mechanics remain the same. LScript will recognize the data type contained by the variable, and reuse any array that it may contain (expanding the number of elements in the array, if necessary).

```
...
layers[10] = nil;
layers = fglayers();
...
```

The LScript array() function can also be used for creating arrays (single- or multi-dimensional) within your script's logic:

```
...
// equivalent to
// "layers[10] = nil"

layers = array(10);
...
```

Question: I found this code:

(blow,bhi)=boundingbox()
in a sample script. Does this mean the following is legal:

```
(testarray[],resultarray[])=1  
to blanket-initialize two multi-dimensional  
arrays? It doesn't seem to work. Should it?"
```

Answer: No, it shouldn't.

The first script line above is called an "associative" assignment. Because boundingbox() returns two vectors, doing an assignment to a single variable will cause LScript to create an array to contain the returned values:

```
...
// creates bb[2]
bb = boundingbox();
...
```

However, LScript arrays can be costly in terms of both memory and speed. So by using associative assignments, you can assign returned values directly to variables on a one-to-one basis, bypassing array creation.

On the other hand, if you wish to "blanket-initialize" arrays, you would use the empty bracket operator to indicate array initialization:

```
...
testarray[] = 1;
resultarray[] = 1;
...
```

The requirement of this type of initialization is that the array must already exist.

Question: "I'm having trouble getting the boolean() command to work. I create two objects, call boolean() and nothing happens!"

Answer: In order to use the boolean() command, there is a certain amount of setup required. Just as in the interactive environment, the target object must reside in the currently active foreground layer(s), while the template object must be contained in the active background layer(s). You cannot use objects as templates that reside in background layers that are not active (selected).

The following short Modeler LScript creates two new objects from scratch, aligns the layers properly, and then invokes the boolean() command to correctly subtract the template object (background) from the target object (foreground). The results are illustrated in Figure 1.

```
main
{
    lyrsetfg(2);
    makebox(<-25,-1,-25>,
            <25,1,25>);
    lyrsetfg(1);
    makebox(-5,5,5);
    lyrsetbg(2);

    boolean(SUBTRACT);
}
```

Now, the script above makes a large assumption about the state of Modeler. It assumes that the layers that it uses are not already populated with mesh data. A more robust script would have asked LScript for information about empty layers, and would have restricted its processing to those confines.

Crossing the Tracks

Modeler LScript has given us a good look at this new control language for LightWave. However, beginning with my next installment, we shall leave Modeler behind for a time. We will expand our programming possibilities by beginning a journey through Layout LScripting.

Bob Hood is in charge of LightWave 3D's plug-in SDK development for NewTek.

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Mystic Knights image courtesy
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Flying High

TIPS, TECHNIQUES, TUTORIALS, AND SHORTCUTS FOR YOUR VIDEO TOASTER FLYER PROJECTS

BY JOE
TRACY

Questions, Answers, HDTV, and Shortages WHERE WILL IT ALL END?

Since my last column, NewTek has announced that it is working toward HDTV solutions for video producers and animators. The announcement was enough to perk the ears of *BusinessWeek* magazine, which ran an article on NewTek in the September 21 issue. In one part, the article stated, "...Whether it [NewTek] can regain its past glory will depend mostly on the success of Jenison's newest invention, now nearing completion: a Video Toaster for the era of high-definition TV-technology that will let programmers and animators produce standard, digital, and HDTV content on a Windows PC."

Meaning Behind Announcement

So what does this mean for current Video Toaster and Flyer owners? In the short term, not much. It is my understanding that NewTek is still doing Amiga solutions, including HQ6 mode for Flyer owners, although it almost seems like "too little, too late." The good news is that NewTek is apparently committed to providing an upgrade path for Toaster/Flyer owners, meaning that if it ever does leave the Amiga market for a Windows-based system, you should save a bundle on a "trade-up."

A4000 Situation Doesn't Help

It is my opinion that the Amiga 4000 shortage, which no one seems to be doing much about,

could end up deciding NewTek's permanent direction in the marketplace. If nothing happens, it would be a massive loss to the future of the Amiga as NewTek is, by far, the largest company to stick it out with the platform for this long.

I have another large batch of questions and answers, so let's get right to it!

Question: The Amiga is a vitally important part of my video production studio, which has me worried about the Year 2000 issue. Will my Amiga be affected?

Answer: According to the Amiga, Inc. Web site only one aspect of the Amiga will be affected in the Year 2000 and that is only on select systems. "The Year 2000 problem and the

Amiga" article on its site states, "The SetClock program shipped with the Amiga Workbench disk revisions 1.2 and 1.3 exhibits a bug which causes it to miscalculate the battery backed up clock time starting with the year 2000. It is accurate only for the years 1978 to 1999. Once the year counter rolls over to 00, SetClock will believe that the year is 1978 until the year 2079 is reached; that's when it will believe that the year is 1979, which is not necessarily an improvement. Please note that only the SetClock program found on the AmigaOS 1.2 and 1.3 Workbench disks suffers from this problem."

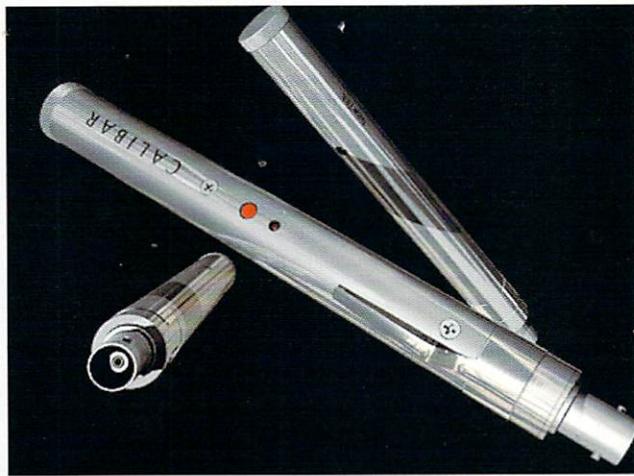
If you have access to the Web, you can get a large amount of information on the Amiga and

COMMENTS OR SUGGESTIONS

email:

jtracy@

advanstar.com



"This image of NewTek's Calibar was created by Doran Jones on an Amiga computer using LightWave 3D 5.0. It contains 8,876 polygons. There are no maps on this object; every detail is modeled as closely to scale as possible."

Year 2000 situation at www.amiga.com/092098-y2k.html. There is a fix provided for this problem!

Question: In the last issue of *NewTekniques*, you expressed an opinion that upgrading to the Flyer (from a Video Toaster) was a good idea. If you were a video producer in the marketplace today and didn't own an Amiga, would you still recommend the Flyer?

Answer: In all honesty I can't say that I would. I still use my Flyer on a regular basis and consider it to still be one of the best video production solutions on the market. However, the lack of Amiga 4000 computers and lack of major updates to current Flyer owners concerns me greatly. Until Gateway dedicates itself to getting Amiga 4000 computers back on the market and NewTek puts more efforts into Flyer updates, I wouldn't personally jump at a new purchase. Now, if I were a Video Toaster owner and looking for a good non-linear solution—it would be a no-brainer. I would purchase a Flyer card in a

second.

Question: I have a project that I need to play over and over. What is the best solution to make that happen?

Answer: There are two ways you can do this. One is to move the Replay icon from your ARexx folder to your project window (end of your project). When you playback the project, every time it hits that replay icon it will repeat. The problem is an inconsistent timing. You don't know how long it will take to "prepare" to play once it hits the replay icon. It may be 10 seconds one time and 20 seconds the next time. An alternate solution is to select all the clips in your project and duplicate them! Duplicate the project as many times as you want it to repeat. Your timing will be steady.

Question: Is there a way to place ARexx commands in the Tools menu so that I can access the commands from there?

Answer: Yes! If there is a specific ARexx script you use often, you can follow five easy steps,

taken from the Flyer Mastery Guide, to have it automatically appear under the Tools option in the middle menu.

1. Select Files/Files view.
2. In the top view, select your ARexx folder (RXTools).
3. In the bottom view, select your ARexx folder (RXTools) and then double-click on the StartUpScripts folder that is most likely the first icon on the screen.
4. Move any of the ARexx scripts you use most often from the top folder to the bottom one. When you're done, go to the Project/Switcher view.
5. In order for the new commands to show up in the Tools menu, you need to shut down the Flyer and reload it. When it reloads, check your Tools menu and you'll notice the new commands!

When you use this tip, your scripts will "disappear" from the ARexx directory. This is because they now reside in your StartUpScripts folder. So if you want to access them from your ARexx directory (versus Tools menu), you must first double-click on the StartUpScripts folder. To take them out of your Tools menu, go to Files/Files view and transfer the scripts back to your regular directory.

Renders Image

I was very impressed with the Calibar image that Doran Jones did, which is displayed in this column. Out of hundreds of images submitted for the "Renders" col-

umn every year, only one or two are done on an Amiga. Kudos to Jones for doing such an impressive job at recreating NewTek's Calibar product in the 3D environment.

Press Time Announcement:

At press time, NewTek announced a new upgrade plan for Video Toaster 2000 owners to upgrade to the Video Toaster 4000 card.

Available to registered owners, the pricing strategy is as follows, according to NewTek:

Upgrade from now to Oct. 1, for \$535.

Upgrade from Nov. 1 through Jan. 31, 1999, for \$680.

Upgrade from Feb. 1 through April 30, 1999, for \$765.

Upgrade from May 1 through July 31, 1999, for \$880.

The number to participate in the program is (800)-862-7837.

That's it for this issue's column. By the time you read this, we expect to have a full time Toaster/Flyer columnist writing for the bonus area of *NewTekniques!* As a subscriber you get free access to this area, so be sure to check it out at www.newtek.com/bonus. Until next time, may all your flights be safe and profitable!

Joe Tracy is author of the Flyer Mastery Guide and one of three authors of LightWave 3D Applied, which hits bookstores on Dec. 1. For more information on LightWave 3D Applied, go to www.advastarbooks.com/lightwave.



Station X Studios Aims for the Stars

By Dick De Jong and Molly Dinkins



Hollywood effects houses are cutting back, closing down.

Station X Studios opens.

FX studios struggle with low profit margins and negative cash flow.

Station X Studios expands.

The digital effects boom turns into a tailspin.

Station X Studios blasts off to the stars.

So what's up at the Station? "Station X is a next-generation facility," said Mark Lasoff, Oscar winner for his work on *Titanic*. "They take advantage of today's technology and the more budget-conscious platforms. They also have a group of up-and-coming artists who are hip to the state of the art."





A Station X Studios 747 design created by AristaMenis Tsirbas, the same person who designed the cover design for the premiere issue of *NewTeknikes* magazine in April 1997 and the spider on the cover of this issue.

If your ear has been tuned to the LightWave 3D drum-beats during the last five years, you will recognize a lot of familiar faces at Station X. Grant Boucher, Station X's CEO, started out at Amblin Imaging back in the "seaQuest" days. Amblin's Glenn Miller, Greg Teegarden, and Fred Tepper joined Boucher and Mark Glaser to form the nucleus of the NT team at Digital Domain. (See the April 1997 issue of *NewTeknikes*.)

While at Digital Domain (D2), Boucher began to assemble some of the best LightWave talent from around the world. The team established the viability of using LightWave in feature films. The ultimate proof is in a little

Still Plugged In

The news that Fori Owurowa and Dan Milling had joined Station X sent ripples through the LightWave 3D community because Owurowa had developed MetaNURBS and Metamation for NewTek and the duo had teamed on Morph Gizmo. LightWave artists were worried that NewTek had lost two of its best programmers and LightWave development would suffer.

"We're still part of the LightWave community," Owurowa asserted. "Allen (Hastings) is directly involved. NewTek is looking for us to gain the high ground."

In that spirit, Station X plans on sharing the fruits of its research. "The reason that we're comfortable releasing software tools is because our competitive edge is with our artists," CEO Grant Boucher said.

The first product to come out is Spider (working title at this point), a network rendering program developed by Mitch Middler to manage Station X's computers. Though Allen Crawford said that this ScreamerNet replacement "is useful even for a person with a single CPU. It gives you 100 percent utility out of your assets."

For rendering with multiple CPU networks, Spider allows you to add or subtract CPUs on the fly. You can also prioritize jobs and the CPUs will be accessed accordingly. As an endorsement of Spider's reliability, Boucher said, "Since we have been using it, we have had no nightly render watchers here."

Owurowa was hesitant to pinpoint a release date or a price, but his goal is to try to have Spider ready by the end of the year.

A few months ago, Station X added Lyle Milton to its software development team. Milton is the co-founder with Carla Molchan of One and Only Media and the creator of MacroForm, a LightWave Modeler plug-in. About joining Station X, Milton said, "They asked me." But NewTek was also courting Milton.

One and Only also had its new product, FXtremePro, in beta testing, and Milton realized that "it would take months to get it ready, to optimize it. I decided that it was better to integrate it into what they were doing at Station X." So Milton and Molchan said "yes" to X and moved to the Left Coast. "It just felt right," Milton said. "I feel connected to the team here."

The integration of FXtremePro features into the work that Owurowa and Milling have been developing should unleash a powerful new creature. "We're shooting for the top," Owurowa said, "to make the best character animation package, period." With an undertaking this monstrous, Owurowa declined to give a firm release date, only to say they hope to uncage it early in 1999.

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A Station X Studios LightWave 3D shot of a Jergens dome for a Jergens TV commercial.

project they worked on called *Titanic*. The rest, as they say, is cinematic history.

Many on the Digital Domain NT team of artists became the "founding fathers" of Station X. Joining them was another D2 alum, Allen Crawford, who had been the head of business affairs at Digital Domain. In his three years there, Crawford had negotiated more than \$100 million worth of special visual effects agreements for such films as *Apollo 13*, *The Fifth Element*, and *Titanic*.

Crawford obviously contributes a keen business sense to the fledgling group. To establish the studio's software development team, Boucher recruited Fori Owurowa and Dan Milling, who had been working at NewTek and designing their own LightWave plug-ins (see the "Still Plugged In" sidebar on page 14). Rounding out the development team was Mitch Middler, also from D2. To administer the network of computers and the gigabytes of data, Hector Barrera, Alan Precourt, and Grant Viklund signed on.

All of the founders of Station X are limited partners in the studio, meaning they all have equity in the company. "Though you see the practice in Silicon Valley companies, it's a model that hasn't been used in the entertainment industry," said Crawford, vice president of production development and corporate affairs. "We were tired of the inequities at other companies. We have a fairly flat hierarchy." While new employees do not automatically become partners, everyone participates in a profit-sharing program.

"With this structure, we have gathered a core of world-class and

seasoned artists who feel a sense of ownership. They're just not workers for hire. It creates a more stable environment," Crawford said. Such stability is becoming increasingly unusual in the effects industry considering the boom and bust cycles of studios and the nomadic life of digital artists.

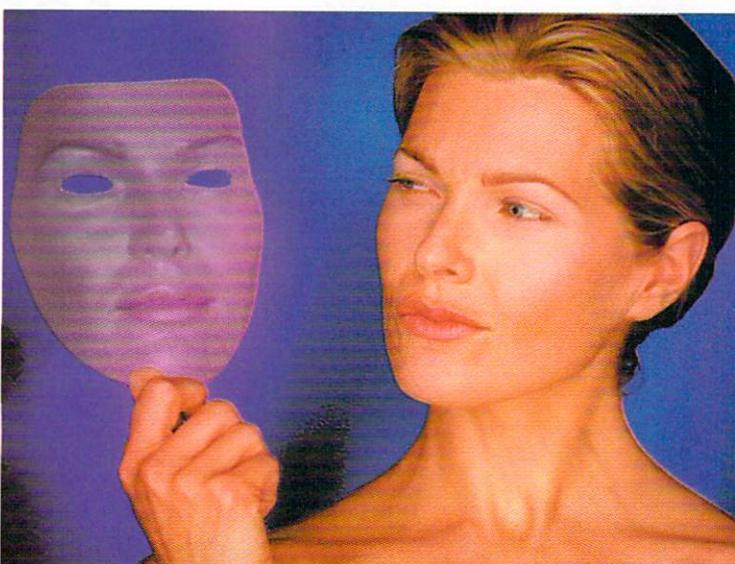
We Have Lift-Off

With this bedrock of talent, experience, and organization, it is not surprising that Station X reached orbit soon after it was launched. In fact, its first project began last December before it was officially open.

Miramax called about working on *Phantoms*, the horror flick written by Dean Koontz and starring Peter O'Toole, Rose McGowan, Joanna Going, and Ben Affleck. Of the 12 shots that the Station X crew toiled over, the zombie crowd scene was probably the most complex. In the all-digital shot, the zombies coalesce to join "mom." To cook up the LightWave concoction, the team started with a cup of Tim Wilson's Humanoids, stirred in a spoonful of Steamer, and added a pinch of Particle Storm.

Station X has also completed work on a shot for *My Favorite Martian* with Christopher Lloyd playing Uncle Martin. Though the movie's release date has been pushed back until next year, you can see the LightWave scoops that are served in the ice cream parlor scene fea-

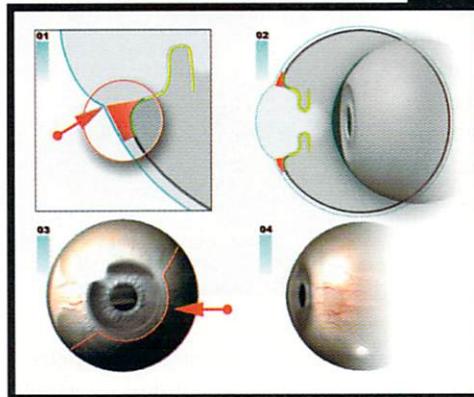
A Station X Studios LightWave 3D shot of a Jergens mask for a Jergens TV commercial.



tured in the film's trailer.

Currently, Station X is involved with one feature film, *Dogma*, one made-for-TV movie, *C.S.S. Hunley*, and one four-hour TV mini-series, "Tom Clancy's Netforce." All are scheduled for release next year.

Dogma is a religious comedy written and directed by Kevin Smith (*Clerks* and *Chasing Amy*) and starring Linda Fiorentino, Matt Damon, Jason Lee, and Ben Affleck. Richard Payne is the visual



effects supervisor for the film. He described the work as a combination of 2D and 3D effects. For example, in one scene, Payne's crew has to create the 3D hole that the Stygian Triplets rend in time with their hockey sticks.

Payne also serves as visual effects supervisor on the *C.S.S. Hunley*, the Civil War drama for the Turner Network. Written and directed by John Gray, the film retells the story of the Hunley, a Confederate submarine that sank the Union warship, the U.S.S. Housatonic, in a battle in the harbor of Charleston, SC.

During pre-production, Gray visited Station X as a courtesy to a friend. "He came in and said, 'I'm going to use models.' That's it," Boucher said. Turner still paid Station X to do a test. "We flew the test to South Carolina and two hours later, we got the OK to do all the work—no models," Boucher added.

Station X has to recreate the two ships—and then destroy the *Housatonic* in a digital pyrotechnic display. The stu-

Through Taron's Eyes

Taron is one of the newest recruits at Station X. The 26-year-old German was snatched up by CEO Grant Boucher's bunch after his evocative LightWave 3D art was spotted on the NewTekniques Web site.

At age 15, he was hired as an artist at Germany's Modern Information Technologies. "I've been drawing since I started to think," Taron said. "My mother said I was born with my eyes open."

Taron was born with his ears pricked up, too. He wrote his first musical composition at age 12. Since his arrival at Station X during the summer, he has filled Frank Aalber's Korg synthesizer with nine songs—good ones, we might add.

Yes, this stunning artist is also a writer—ever since he mastered penmanship. His current projects include a sci-fi epic. And you can expect him to add a LightWave feature to his list of accomplishments. "I want to create a believable world that is beyond reality. 3D allows me to do that," he said.

Meanwhile, he is perfecting digital facial expressions. His visual and visceral visages are disturbingly lifelike. Below, Taron shares his approach to modeling penetrating eyes:

"The magical depth of a real eye has always been an exciting challenge for all kinds of artists. The demand to be realistic in an animation brings this excitement to the art of 3D as well. A character without convincing eyes can't hold the appearance of life, and furthermore can't carry a 'soul.'

To reach this goal, I tried to understand the way light travels through the surface of our eyeballs, and how to simulate it in 3D by considering the transparent appearance of eyes. Basically an eye has two layers of surfaces. The outer layer is the cornea, or the "eyehorn," (the cyan line in Illustration 2 and in the close-up in Illustration 1). The inner layer contains a lot of liquids and veins, as well as the iris (the yellow line in Illustrations 1 and 2). An examination shows that the light doesn't stop on an eyeball, like it does on a regular ball. It seems to go through the surface and come out on the other side, slightly lightening the dark part of it, which makes it look wet and glassy at the same time (see Illustrations 3 and 4).

The light does not travel through the whole eyeball. It just goes through the cornea and hits the border of the iris at the inner layer (see the red curve in Illustration 3). And so the light hits the part of the eyeball that is already in the shadow. Depending on the bending of the inner layer (the green in Illustrations 1 and 2), the glassy effect is caused.

The arcing of the cornea starts pretty close to the edge of the iris (see the red arrow in Illustration 1). The red marked area in Illustrations 1 and 2 shows the difference between the bendings of the cornea and iris. Notice that when the light travels through the cornea, it hits not only the inside of the iris, but also the white jelly parts at the border of the iris (the green in Illustrations 1 and 2). This is where the effect happens (the red curve in Illustration 3). I sincerely hope the illustrations explain it better than my words can.

As a result, this method proves to be an effective way to add a bit more soul to the eyes. Even if I couldn't make my creatures see their creator, I could at least give myself the illusion of being seen. (Kidding.)"

dio is also building digital set extensions of historic Charleston that will be composited with live action plates.

Payne, with his long, antebellum beard, seems the perfect match for this project. When he was on a tech-scouting trip, he was recruited to test the seating arrangement in the mock-up of the Hunley. During filming, he was outfitted as a boatswain's mate and was used as an extra. "After the filming, I bought the sword and pistol that I wore," Payne said.

Payne also directed a second unit effects shot. "In the movie, a rocket hits a church steeple. We will be creating the 3D steeple collapsing. In the live action shot, I directed about 10 stunt people as they fell under the rubble that we'll later add in CG," Payne said. "One woman ad-libbed this great death tremor in her hand."

Alan Chan is the visual effects supervisor of Tom Clancy's *Netforce*, a TV movie that will be broadcast to coincide with the release of Clancy's book of the same name. Station X is building a series of virtual reality displays and digital set extensions.

Ever since it opened, Station X has been working on a steady stream of commercials including Mazda Miata "Satellite Transmission" and Jergens hand lotion, which are airing now. It also has begun producing international ads. Sony hired Station X to work on an ad about the new "Wega" high-resolution television screen. Though the commercial is only airing in Japan, the crew did get to play with the cool new TV until the project was completed.

In probably the weirdest twist of cross-cultural exchange, Station X just completed two new Budweiser commercials that are being test marketed in Beijing, China. In one ad, the wily party insects strategically place a rake in the path of an unsuspecting, bottle-carrying

Richard Payne in costume on the set of the C.S.S. Hunley.

human. After the inevitable plunk on the noggin, the Bud-thirsty ants carry away their prize with a precision that would make the Clydesdales proud.

Relativity, a LightWave plug-in designed by Prem Subrahmanyam, helped control all those little ant legs. Frank Aalbers said, "Relativity rocks!" And rolls, judging from his demonstration in Layout of putting an ant through its paces. In no time, Aalbers had the ant boogying.



A Space Station

The launching pad for all of this activity is an anonymous strip office building near the Santa Monica freeway. The only Hollywood embellishment is Boucher's brand new silver Jaguar convertible parked out front. Inside, a pomp of spaciousness replaces the seductive decorative grandeur so popular in this town. The reception area is an unpretentious affair decorated with artfully framed magazine articles about the start-up company.

The communal eating/meeting rumpus room—a cavern that dwarfs the pool table—could host a jai alai tournament. Capacious as Station X is, (17,000 square feet) the company is planning to acquire additional footage that will allow it to connect its administrative wing with the artists' wing. In the artists' compound, absent are the cramped cubicles where people hunch in dark corners. Even the de rigueur assortment of toys and posters are lost in space.

Often you feel the tour down the



A Station X Studios LightWave 3D shot for a Budweiser TV commercial currently being test marketed in China.

halls of Station X—like all effects studios—is CIA-esque. You step into an office and look over an artist's shoulder at the monitor and hear, "You really didn't see that." Movie studios and advertising agencies are very vigilant when it comes to releasing information on their films or ads.

So any talk about future projects is cloaked in an even heavier veil of secrecy. Beyond the mention that Station X is up for some major feature films, all the Station X files are classified. What Crawford and Boucher are willing to talk about are the strategic alliances that the studio is forming.

Of course, the artists and programmers have always had strong ties with NewTek. Allen Hastings, one of the creators of LightWave, visits occasionally to discuss revisions to future versions. Station X has also forged a strong working relationship with Samsung and Compaq. (When Compaq bought Digital Equipment Corp. it acquired the DEC Alpha processor technology, which it licensed to Samsung.) Station X is basically a DEC Alpha-based studio. "We do software and hardware beta testing for Compaq and Samsung," Boucher said. "We are their principal test site in Hollywood."

Crawford is also working on developing equity relationships with film producers. Traditionally, effects houses are "service bureaus." A movie studio will hire effects houses to create the effects, pay for services, and that's the end of it. Boucher and Crawford are willing to defer some of Station X's fees and recover the fees from their equity share of the film's profits. This arrangement allows a producer to control the up-front expenses. Station X is already involved in a number of equity sharing negotiations.

So with a progressive philosophy to guide the journey, cutting edge technology to fuel the engines, and the artists/partners to crew the ship, it's no wonder that Station X is rocketing to the stars.

Or as Lasoff said back at the Station, "They've got the goods."



Station X Studios Kevin Smith and Richard Payne.

I Would Like To Thank the Academy

Even with the talent already onboard, Station X celebrated when Mark Lasoff recently joined the crew. As digital effects supervisor on *Titanic*, Lasoff received an Academy Award for Best Visual Effects.

"Mark brings 10 years of solid experience to a business that is only 10 years old," Crawford said. "One of his specialties is managing production pipelines for huge amounts of data for blockbuster films. With Mark, clients need not worry that Station X can handle the big jobs."

Lasoff also has won an Emmy as animation supervisor of the computer graphics opening for the *Barcelona Olympics*. In addition to his tour of duty on *Titanic* while at Digital Domain, Lasoff worked with visual effects supervisor Rob Legato on *Apollo 13* and *Interview with a Vampire*. "I consider Rob a mentor," Lasoff said. "He's one of a handful of world-class visual effects supervisors."

In July, Lasoff left Digital Domain and started to freelance. One of those projects took him to The Mill in London where he supervised an all-CG commercial for Mobil Oil.

As for his future with Station X, Lasoff said, "An area I really want to develop for the company and for myself is producing all CG films. It comes down to having more access to the filmmaking process and becoming a leader in that process. You become more the filmmaker."

Speaking about his reunion with the Station X team, Lasoff said, "The core members have known each other for a long time and have developed a real level of trust and responsibility. They're a family." He added, "I feel confident that they can make me look good. And supervisors are interested in that."

LightWave 201

A UNIVERSITY-LEVEL COURSE WITH INCREASINGLY DIFFICULT LIGHTWAVE TECHNIQUES



BY SCOTT WHEELER

The final installment in
the second level of
LightWave courses
—“LightWave 201.”

Project Bird: THE FLOCKING FINALE

Well, here it is at last, the graduation class for LightWave 201. Hopefully this has been a fruitful year for everyone. Did everyone bring his or her homework? If you did not or you had difficulty with it, I have a scene for you that shows the lighting diagram you should use. The scene is called “Longhouse_Lights.lws.”

If you do a Load from Scene in the Objects panel into your existing Longhouse scene you will be able to get the lights you need. You will also need to delete the “Light” that is in the “Longhouse_Pass01.lws” scene and set the Ambient Levels as follows:

Ambient Color:
(R: 174, G: 174, B: 255)
Ambient Intensity: 5.0%

Figure 1 is the “Longhouse Panarama.iff” image you should get as your final render. Now, on to the new stuff.

I hope you saved your past work because we are going to use the “BirdFlapping_Base.lws” scene file. If you don't have it, not to worry, I'll have it available for you to grab. To finish off our scene we will be making 100 birds fly into our Longhouse door. If we were to simply clone 100 of our little birdies then they would all be flapping at the same time. This would look, well, bad. Not to mention it would be cause for people to laugh and point at you

when they viewed the scene. So, to avoid any unnecessary ridiculing by one's peers we will be making a series of different flap cycles for our birds that we will then clone out to the 100 birdies.

Load in the “BirdFlapping_Base.lws” scene we created oh so long ago. This scene has our bird with his eight-frame flap cycle. What we want to do is create a flap cycle that is one frame offset from this. Open the Scene Editor; it should look like Figure 2 with the first five bones having eight keyframes apiece. What we need to do is create a space to copy the last keyframe of every bone back to the first frame of the cycle. We do this with the Shift All Keys button. After acknowledging we understand the consequences of our actions, enter the following into the Shift All Keys requestor:
Low Frame: 0

High Frame: 60
Shift Frame By: 1

Setting the High Frame to 60 is overkill since we only need to go past the last keyframe in the scene, but better safe than sorry. After clicking OK, the Scene Editor should look like Figure 3. There is now a gap in all the bone motions where we can move our last keyframe.

While still in the Scene Editor highlight “Bone (1)” and open the Graph Editor [m]. You will notice that there is a small gap in the motion file at frame 1, the same as in the Scene Editor. In order to fill that gap move forward through the keyframes [right arrow] until you get to frame 9. Once on frame 9 activate Create Key Frame [Return] and make a keyframe at frame 1. This will copy all the settings from frame 9 to frame 1. We complete our



Figure 1

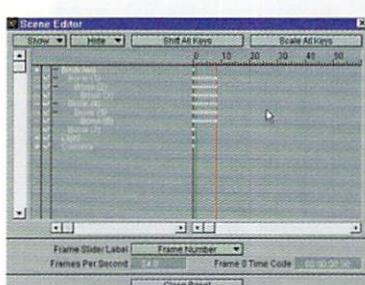


Figure 2



Figure 3

new loop by moving forward [right arrow] to frame 9 again and deleting [Delete] the frame. Our loop for this bone now cycles from what used to be frame 8 up to the old frame 2. Thus we have offset the motion for this bone one frame and still maintained our loop capabilities. Click on Use Motion to save our changes.

By now you may have realized the painful and repetitive task we have in store. You will need to repeat Step 2 for each of the six wing bones. When you have finished that, save the scene out as "BirdFlapping_Shift1.lws" so that we can tell which scene the bird is in. Once you have completed that you will need to repeat the same shift process again until you have seven scene files for shifts 1 through 5.

Knowing human nature, I can feel your pain after having just read the last passage. So, I made the scenes for you. No, no, don't thank me. I am happy to do it for you. I do recommend you do at least one by yourself since it is good practice for moving around in the Graph Editor.

Now that we have six scenes created for our birds we need to merge them all together into one scene file. Load in "BirdFlapping_Base.lws." Open in the Objects Panel and click on Load from Scene. Load from Scene allows us to load any scene file into our current scene bringing with it all of its information. This is very handy in situations like this where we want to get our birds and their corresponding bones. In the Load

Objects from Scene File requestor load in "BirdFlapping_Shift1.lws." We do not need any light information from any of our bird scenes so answer "No" to loading lights.

We now have two birds in our scene. One at the base flap cycle and another at a 1 frame offset. If all went as planned your screen should look like Figure 4 at frame 1.

4. Repeat Step 3 until you have loaded in all of the offset bird scenes. Once you have finished that, your screen should look like Figure 5.

5. We will be making multiple clones of these birdies to build a scene with a flock of 100 birds. Before we get to cloning, though, let's click on Add Null Object to add a null to our scene. We can rename the null by clicking on Save Object and naming it "Flock_(NO)". By putting the "(NO)" at the end of the name we create an easy convention for knowing what are objects and what are nulls in our scene.

6. Open the Scene Editor and select "Birdy.lwo (1)." Later we will be adding these objects to another scene and then applying motion we create in Particle Storm. As a good habit to follow, we will be parenting all the birds to the "Flock_(NO)." This way if we want to remove the objects from the scene we merely need to remove the "Flock_(NO)" and all the children go with it. With "Birdy.lwo" still selected click on Parent and choose "Flock_(NO)" as the parent. Repeat this with all the birds until your Scene Editor looks like Figure 6.

7. To finish this phase of the project open the Objects Panel and Clone Object your birds until there are 100 birdies in this scene. The order in which you do this is not important but make sure you don't add large clumps of the same cycle next to each other. The more random you make the dispersal the harder it will be for viewers to pick up the relatively few different cycles.

When you have finished making 100 birds, Save the Scene as "BirdsFlapping_100.lws" and Clear Scene to start the next phase with a clean Layout.

8. Next we will construct the scene to put our flocking birds into. Since we want the lighting to match the first scene we used to create "LonghousePanarama.iff," load in the "Longhouse_Lights.lws" scene. Before we move on let's Save the scene as "Longhouse_Pass02.lws." This way we won't inadvertently save over the "Longhouse_Lights.lws" scene.

9. Open the Images Panel and Load in the following images we will be using for this section "LonghousePanarama.iff," shown in Figure 1, "Shadows.iff" shown as Figure 7 and "BirchTreesFog.iff" shown as Figure 8.

In order for us to achieve the panning effect we want, we need to create a polygon to map our Longhouse on to. For this we need to go into Modeler.

10. Once in Modeler, activate the Box Tool and enter the



Figure 4

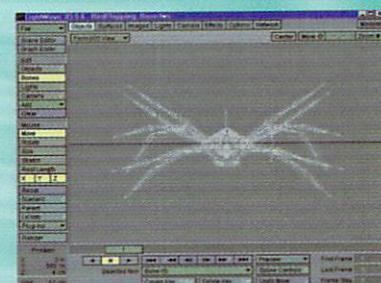


Figure 5

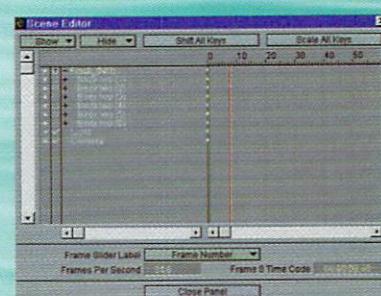


Figure 6

following Numeric [n] values:

Low
X: -9.2m
Y: -5.2m
Z: 0m

High
X: 9.2
Y: 5.2
Z: 0m

Leave the segments at 1 and click OK. Make [Return] the box. Open the Change Surface Panel [q] and name the surface "Back-Plate_Pass02."

11. In the Objects Tab, Put the box to layout as "Back-Plate_Pass02.lwo."



LightWave 201



Figure 7



Figure 8



Figure 9

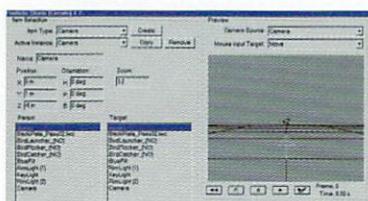


Figure 10

12. Back in Layout open the Surfaces Panel. Make sure the Current Surface is "BackPlate_Pass02" and open the Texture Panel for Surface Color. Set the following values:

Texture Type :
Planer Image Map

Texture Image:
LonghousePanarama_iff

Texture Axis : Z Axis

Texture Antialiasing: On
Antialiasing Strength: 0.1

Click on Automatic Sizing to stretch the image to fit and leave all other values at their defaults. Click Use Texture to save the changes.

B. Since we never had a ground to cast shadows on in the first pass we will be faking shadows through the use of a Luminosity Map during this pass. Below Surface Color open the Texture Panel for Luminosity and set the following values;

Texture Opacity: 50%
Texture Type:
Planer Image Map
Texture Image: Shadows_iff
Texture Axis : Z Axis

Again, click on Automatic Sizing to stretch the image and close the panel by clicking Use Texture. Finish the surfacing by setting the Luminosity to 100%.

For those of you who are wondering why we set the Texture Opacity to 50% and the Luminosity to 100% instead of just using the values in the grayscale image "Shadows_iff" we did this so that we can have more control over how dense the shadows appear on the ground. This way you can tweak the Texture Opacity and the Luminosity to get different shadow strengths. Before we move on Save the "BackPlate_Pass02.lwo" object so the texture values are saved

to the object.

14. Move the "BackPlate_Pass02.lwo" object into position at;
X: -27cm
Y: 1.95cm
Z: 9m

If all is on track a rendering of frame 0 should look like Figure 9.

B. Now let's add a camera move that will give the illusion that we are panning across this scene. This is actually an old matte painting trick updated to the digital era. In Camera Mode [Shift - c] set the following values for Move:

Frame 0
X: -1.64m
Y: 73cm
Z: -2.5m

Frame 180
X: 1m
Y: 1.4m
Z: -2.5m

This should create a slow pan from the lower left to the upper right of the backplate object.

16. In the Effects Panel under the Compositing Tab set "BirchTreesFog_iff" as the Background Image. Also in the Effects Panel under the Background and Fog Tab set the following values;

Fog Type: Nonlinear 2
Minimum Fog Distance: 0m
Maximum Fog Distance: 1m
Minimum Fog Amount: 30%

Maximum Fog Amount: 30%
Backdrop Fog: On

The Minimum and Maximum amounts are set the same since the distance that our birds will travel does not justify having them fade into any fog. Instead we will use the fog in the same fashion we did on the Longhouse, to add the tonal values of the background to the flock.

11. Since "BackPlate_Pass02.lwo" is the background image we want to preserve we need to make sure that it does not get any fog. Open the Object Panel and set the following values for "BackPlate_Pass02.lwo":

Unaffected by Fog: On
Self Shadow: Off
Cast Shadows: Off
Receive Shadows: Off

Now, no matter how much fog we add to the scene our apparent background will remain the same.

Now we are ready to add the elements we will need to make our birdies flock to the Longhouse. In Particle Storm we will be using 100 particles that will be replaced with the 100 birds we created earlier. In Layout we need to setup several nulls that will be used in Particle Storm to place where the birds will travel to and from. We set these marks in Layout through the use of Null objects.

18. Open the Object Panel and add three null objects. Name

them as follows:

Null (1): BirdLauncher_(NO)
Null (2): BirdFlocker_(NO)
Null (3): BirdCatcher_(NO)

19. The "BirdLauncher_(NO)" will be used for, you guessed it, placement of where the birdies will be traveling from. This object should be behind the camera so the birds fly past closely. To do this it must mirror to a certain degree the motion of the camera. Enter in the following keyframe information to accomplish this:

Frame 0
X: -5.45m
Y: 3m
Z: -6

Frame 180
X: 0m
Y: 3m
Z: -6

20. The null object will be used to place a flocking attractor that the birdies will desire to be close to. We want the little critters to fly to the doorway so let's place the first null "BirdFlocker_(NO)" near the doorway of the "BackPlate_Pass02.lwo" object. Enter the following values for "BirdFlocker_(NO):"

Frame 0
X: 3.15m
Y: 1.125m
Z: 6.65

This object is the corralling force that will get the birdies traveling in the right direction.

21. The "BirdCatcher_(NO)" is the powerful flocking attractor that will hold the birdies from flying off. This object will be placed behind the "BackPlate_Pass02.lwo" object so that the birdies fly through the plate and

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appear to have entered the Longhouse. Place "BirdCatcher_(NO)" in the following location:

Frame 0
X: 3.85m
Y: 1.225m
Z: 10.475m

Now for the fun stuff. I will be using Particle Storm version 1.2 for this section. As of this writing there is a later version of Particle Storm but I have had good luck with this version so I stuck with it. If you have a later version of Particle Storm the process is still the same.

Since Particle Storm is such a dense piece of software it would be impossible to give an overview of all its functionality in the space provided for this article. Therefore, we will only be skimming over the areas we need to perform the task at hand.

In the lower left side of the Layout window is the Plug-ins button. Click on it

and drag down to Particle Storm. You will be presented with the following screen, Figure 10.

This is the main Particle Storm window. It in many ways mimics the functionality of Layout with the preview window showing the familiar grid we have all come to know and love.

Before we start playing with those zany specs we call particles let's get the boring housekeeping out of the way first. In the lower right under the preview window is a button marked Project, click on it to open the Project Options Panel. What we save in here will be different for each of you since you will undoubtedly have different content directory structures in place. Therefore, set the Content Path to the same path you have for Layout and pick an Output Path where you know you can find the files Particle Storm will be creating. With the paths

Continued on page 37



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BY
GREG NELSON

SAYING GOOD-BYE TO "BABYLON 5"

I don't know about you, but I have a soft spot for "Babylon 5." To early LightWave 3D users, this has been *the show*. "Babylon 5" has been through more versions of LightWave 3D than any other series on television.



The "Babylon 5" space station explodes in a fiery destruction.

In my first couple years of animating, I learned much about LightWave by watching "Babylon 5" and reading Mojo's articles in *LightWave Pro* that broke down how they did specific shots. In fact I just did a shot the other day that used an old B5/LWPro/Mojo trick.

"Babylon 5" (B5) is completing its five-year run this season on TNT and will be followed by a

spin-off series called "Crusade" that begins in January. If you don't want to know what happens in the final episode, stop reading now until after you see it.

As with many great vessels of television space, the B5 station will meet its end in a symphony of fireballs, lens flares, and particle explosions. Trust me, I've seen it. It's definitely worth watching. You might even think about recording the show so you can watch the explosion frame by frame; there's some fun stuff that goes flying past the camera.

Netter Digital in North Hollywood, CA, was kind enough to give me a preview, and animator Tim Everitt told me how he pulled off some of the shots.

"In a previous episode, I was given the task of blowing up Babylon 1," said Everitt. "In that shot, it was a huge explosion and I wanted to try something different with B5." Everitt said he wanted to give the feeling that the huge space station was collapsing in on itself as flames engulfed it.

As the sequence unfolds,

explosions begin ripping the hull open from one end to the other. The explosions and the bending of the metal make the shot look as if the entire space station is being unzipped, allowing flames and the internal atmosphere to spill out into the vacuum of space.

Now, everyone has a certain way of pulling off shots, and everyone has a philosophy for choosing which way to go. I am a passionate believer in the "think about it before letting some lame render-hog of a plug-in do it for me" philosophy. Don't get me wrong, I use a lot of plug-ins, some of which make my life extremely easy. However, I'm a much bigger fan of thinking a shot through and doing the work, rather than praying the latest beta version of Photoreal.p will bail me out.

That's why I love this shot. It adheres to my above philosophy and everything in it can be done with LightWave straight out of the box.

"This shot lives in Modeler," Everitt said. In order to create the

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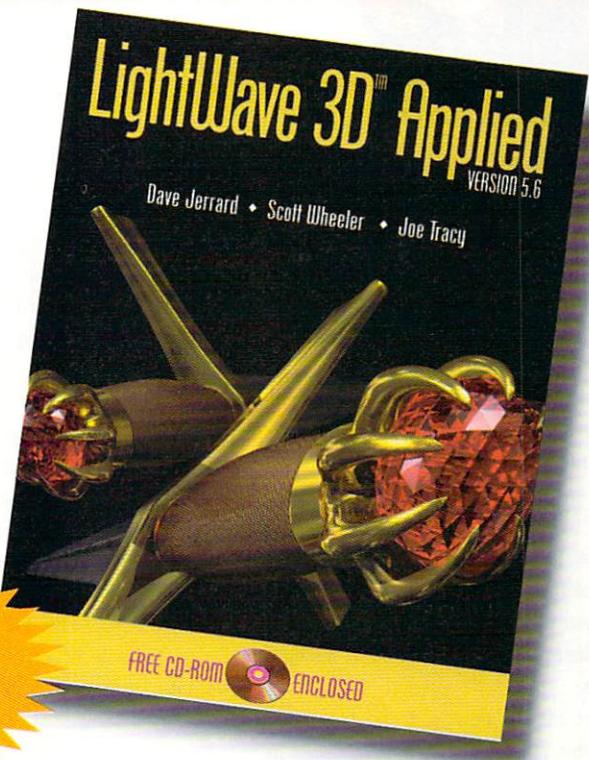
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hull breach, the base B5 model is cut open in Modeler. Along the line of the cut, points and polygons are bent outward and away from each other. This is done nine different times giving the base model nine different morph targets, each with an increasingly wider and more lengthy expanse of hull breach.

For the fire, Netter Digital chose to shoot explosions specifically for compositing in this sequence. "One of the issues we ran into was the immense size of the B5 station... in scale it is five miles long," Everitt said. One of the flame elements is supposed to feel as if it is engulfing the station from one end of the ship to the other.

It doesn't matter how you shoot a small explosion, fire can never travel five miles in less than 30 seconds without completely ruining your sense of scale. To help ease this issue, Everitt did two things. First, he slowed the fire

sequence as much as possible in Adobe After Effects. "One trick I like to use," said Everitt, "is mapping a fire sequence on to a sphere rather than a flat polygon. This at least gives you more flexibility in terms of being able to move your camera and shift perspective."

The second thing Everitt did was add particle explosions. By placing a cluster of single point polygons in the center of the explosion and expanding them outward at the proper speed, either by morphing to a larger cluster of single point polygons or by simply expanding the object's size, this particle explosion saves the shot's sense of scale. It tricks the viewer's eye into thinking things are moving slower than they actually are.

One of the other elements in the shot is the outward eruption of certain panels on the station. This is actually pretty simple and has a great effect on screen. Everitt cut the panels

he knew would be flying off in front of the camera, and moved them far away from the station in Modeler. Then when the proper timing is set to the original nine morph targets, the panels blow off in perfect orchestration—no keyframing, and no small objects to manipulate. It's just nice and clean.

Now, no space station is going to meet its end in LightWave without a lot of lens flares and interactive lighting. Since all the fire was composited in Layout and mapped on polygons, one of the issues you run into is polygons cutting into each other.

It is impossible to tell from the final product, but a lot of the explosions are mapped on to polygons that are actually cutting into the B5 model. Now, obviously, this situation is going to have rendering errors without some help and that's where the lens flares come in.

"I placed lens flares right where the poly-



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gons intersect," said Everitt. By timing the flares to the fire sequences, they can distract the eye and cover over any mistakes.

Admittedly, I haven't been a "Babylon 5" faithful. But every time I ran across it, I'd stop. Not necessarily because it was a particularly compelling story line, but in a sense to pay homage to what that show has meant to my career and my skill as an artist.

It's kind of the same way I feel about my Video Toaster. I just sold it the other day. It had been sitting on my shelf for the last two years, but it meant a lot to me. The entire foundation of my career was built with that Amiga 4000. So, it meant a lot to me that I was giving it to a 14-year-old kid who was just getting started. I wish I could pass on to him everything that machine taught me.

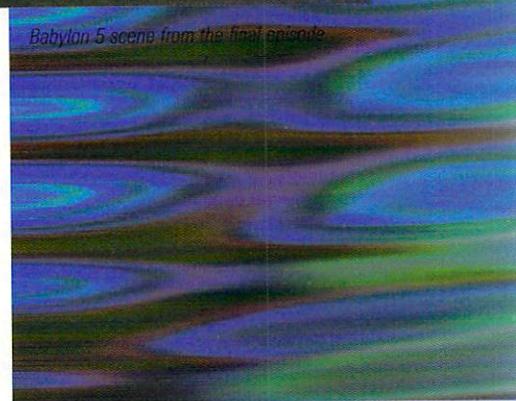
"Babylon 5" is going off the air. TV shows do that; they come and go. I just wish I could



Babylon 5 scene from the final episode

pass on everything I learned from B5 to my 14-year-old friend as well.

Greg Nelson is a partner in the Lemonade Visual Effects Co. and is currently directing a short film called Days of War. He can be reached at Kidneyboy@MSN.com.



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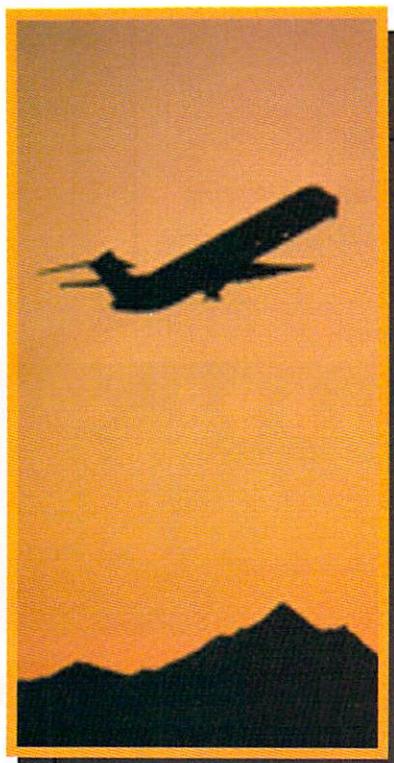
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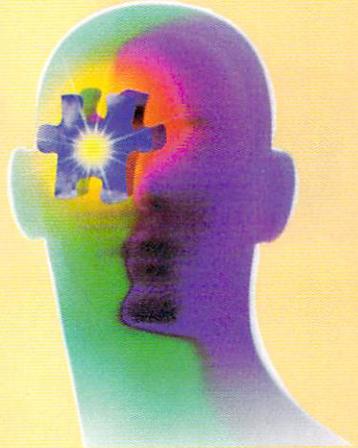
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Gems That Will Make the Cut!



Some gems are rare, but this tutorial will have you creating many.

BY DAVE JERRARD

The "Sword in the Stone" chapter of the book (Chapter 6) covers the construction and texturing of a sword, including a variety of gemstones for the pommel. As a small preview, we'll take a closer look at gemstones here.

1. Let's get started by loading up Modeler and zooming in to a grid size of about 5mm. We'll create a very simple gemstone, so under the Objects menu, click the Ball tool and then type 'n' to open the Numeric Panel for it. We'll make a very simple faceted stone to start

things off with, and since most faceted stones have triangular facets, we'll use a tessellated ball.

Ball Type:

Tessellation	Level:	2
Center	Radius	
X: 0 m	15.0 mm	
Y: 0 m	10.0 mm	
Z: 0 m	8.0 mm	

Hit 'Enter' to make this ball, then type 'q' to open the Change Surface panel. We'll make this a generic gemstone, so pick any color you like. We'll name this surface "Gem" and make it 75% specular for now. Set the Glossiness to medium

and leave the Smoothing off. The color preview should show something resembling a cut gemstone (Figure 1).

Our first gemstone is going to be one of the transparent types, such as a diamond, ruby, topaz, etc. To do a stone like this correctly, we'll need to use refraction, which will bend the light as it enters the stone. However, we also need to bend the light back as it exits the stone. We can't simply make this surface double sided since that would end up having the light refract a certain amount

when it hits the outside surface, then it would refract that same amount again as it hits the second surface as it exits. This effectively doubles the amount of refraction when we want to cancel it out. To do this we need a second, inward-facing surface to tell the exiting light that it is now entering air again. This inward facing "air" surface is very important when trying to recreate anything that involves refraction accurately.

1. Hit the 'c' key to make a copy of this object in memory, then type 'f' to flip the polygons of the stone on the screen. Type 'q' to open the Change Surface panel, and create a new surface called Air. Now, hit 'v' to paste the copy we made into the layer. Type 'm' to merge the points since we'll now have 162 duplicates we don't need. Now we're ready to make this stone sparkle.

3. Save this as GemStone.lwo and switch over to Layout. Load the GemStone.lwo and position the camera so you have a good view of the gem. Open the Surface Panel and select the Air surface. We'll need to make this transparent for our gem to look right, so

raise the Transparency to 100%. Also, raise the Specularity to 100% and set the Glossiness to Low. Activate the Color Highlights button and raise the Reflectivity to 25%. This will set up our internal reflections, which will give the gem its sparkle. Click the Reflection Options and select the MetaRefMap.iff image as the Reflected Image. For the Reflection Type, we'll just use Spherical Reflection Map, which will render a lot faster than tracing several recursions of internal reflections. Since this will be a cut gemstone, we don't want to add smoothing, so make sure that's off. Finally, make the Surface Color pure white.

You'll notice we activated the Color Highlights button, but there's no effect in the preview samples. Well, not yet. We'll get back to that a bit later.

4. Select the Gem surface now and set the transparency level to 100% as well. We'll start with a basic clear gemstone to get a feel for how it handles and then add color later. And what better clear gemstone than a diamond? Set the surface up with these base values to get started:

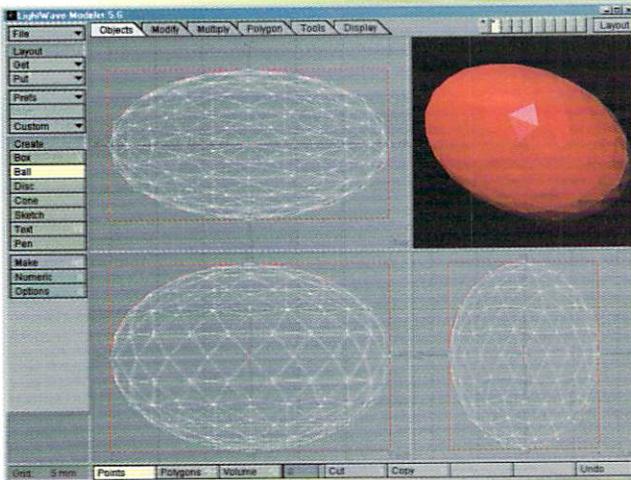


Figure 1. A very simple gemstone quickly created with the Ball tool.

Color:200 200 200
Luminosity: 0%
Diffuse: 10%
Specular: 75%
Color Highlights: Off
Glossiness: 64 (Medium)
Reflectivity: 20%
Transparency: 100%
Color Filter: On
Smoothing: Off

These values will work for just about any gem type with a simple color change. We've applied a Color Filter to this surface, which will only slightly darken anything seen through it due to the light-gray color we gave the surface, as will be seen in a preview sample with a patterned background. A pure white would have the effect of neutralizing the effects of the Color Filter, while any other color will show up. We'll need this Color Filter for gems such as ruby and emerald, so we might as well leave it on.

5. Finally, we need to set a Refractive Index. This determines how much the light is bent as it enters the gem and it varies



Figure 2. The Refractive Index at work.



Figure 3. The Interference shader adds some interesting coloration to our crystal.

Tutorial



Figure 4. A simple color change turns our diamond into a ruby.



Figure 5. The addition of a Fresnel shader makes the ruby seem darker in the center, at its thickest point.



Figure 6. The Thin Film shader can simulate density quite effectively, as well as other color effects.

depending on the material you want to simulate. We're doing a diamond, so we'll need a value of 2.417, as shown in the Refraction Index chart in the LightWave Reference Manual. You might want to mark that page since

we'll be using it quite a bit here. But first, let's see that refraction at work. Open the Render Panel and activate Trace Refraction in the upper right corner. Close this panel and then hit F9 (Figure 2).

The gem is nearly finished but we'll add a few subtle improvements before we move on.

Our first improvement will be the addition of the Fast Fresnel shader. Though the effects it creates tend to be subtle, they will add that extra sparkle that's currently missing. We'll apply this effect to the outside surface so open the Surface Panel and select the Gem surface. Click the Advanced Options tab and select the LW_FastFresnel plug-in. We only want the Reflectivity set to 75% and Specularity set to 100%. Everything else for this shader will be turned off and the Minimum Glancing Angle should be 0 degrees. Click OK to accept these settings.

The Fresnel effects will generate more intense reflections around the edges of the gemstone, adding some much-needed sparkle. However, there is still one thing missing. Physical gems tend to diffract light into its color components, creating brilliantly colored internal reflections. LightWave does not support this phenomenon, though it can be

simulated.

When we created our Air surface, we applied the Color Highlights option to it, even though it had no color to add. We'll give it that color now, but in a much more dynamic way. For the second Shader plug-in slot, select the LW_Interference plug-in. Click the Options button and make sure the Spectrum Scale is set to its default 100%. Click the check box for Single Band, and then change the Angle Range values to span from a Minimum of 0 to a Maximum of 90 degrees. Finally, select the Blend button for the Color Mode and set the percentage to 100%. This will now color the inside surface according to its angle to the camera, covering the entire spectrum. Since the surface is 100% transparent, we won't see

these colors, but they will affect the highlights and reflections that cross the surface. Another render will show a gem with more sparkle and colored highlights inside (Figure 3). Rename the Gem surface to Diamond, then save this object as GemStone-Diamond.lwo since you might want to use this later on.

Now that we have the basis for just about any gemstone we want, we can play with surface colors. Ruby is a common favorite so let's try that. Select the Diamond sur-

face and rename it to Ruby. The first thing to do is change the color, so click the Surface Color button and change it to a deep red. RGB values of 180, 0, 0 give a good shade. Ruby is less dense than diamond is, and has a Refractive Index of 1.77, so that's our other main change. Since we have Color Filter activated on this surface, everything we see through the gem will have deep red colors. On a black background, this stone will almost appear to be an opaque black so let's brighten the backdrop a bit. Open the Effects Panel and click the Gradient Backdrop button. Now we'll have a better background to show off the gem. Hit F9 for another render (Figure 4).

Our ruby doesn't look too bad at all. We can still improve on it, though. One detail is still missing, and that's a sense of volume. A ruby, or any other colored gemstone, will absorb light as it travels through the crystal, becoming darker as the thickness increases. Right now, our ruby has the same constant opacity across the surface so everything seen through it is filtered the same amount. In step 6 we added the Fast Fresnel shader to this surface, and at the same time, we activated the Transparency portion of it. Up until now, it has had no effect since

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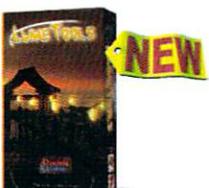
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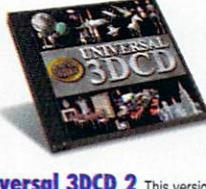
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Tutorial

both the Fresnel Transparency value and the base Transparency value have been identical. Open the Surfaces Panel and click the Basic Parameters tab. Lower the Transparency value to around 75%. This just made our gem less transparent to perpendicular rays, while the Fast Fresnel shader keeps the edges at 100% transparency. When rendered, this will make the gem appear to be darker in the center where it's thicker. (Figure 5) Try other colors and experiment with the Transparency value. Remember to save the surface settings you like. You never know when you'll want to use them again.

10 There is another method of making a gem appear darker in the center, or even appear to be a different color altogether.

Similar to the method we used to change the highlight colors of the Air surface; we can use another plug-in to alter the colors of the outside surface. Click the Advanced Options tab and select the LW_ThinFilm plug-in for slot 2. This is very similar to the Interference plug-in, but much more selective. Click the option button and a small interface will open with a full color spectrum displayed across the top. Click anywhere in this spectrum to select a color, which will show up as a value measured in nanometers (nm) appearing in the Primary Wavelength field. This is the color that will appear on the surface when viewed at 90 degrees.

The second value, Angle Variation, tells the shader how much of the spectrum will be visible across the 90 degree arc, where

the viewing angle becomes 0 degrees. Again, this is measured in nanometers, and is added to the Primary

Wavelength. This value may also be negative, so you can have a range start with a dark red and span to light orange, or go from dark blue to light blue.

The color can be applied in one of three ways: Add, Multiply, and Blend. We'll be using the Blend option, so click that button and increase the percentage value beside it to 100%. Now, the colors we select in this panel will completely overwrite the Surface Color.

We can recreate our ruby surface here by setting the Primary Wavelength to 780 nm and setting the Angle Variation to -150 nm. Be sure to raise the base Transparency value back to 100%, then hit F9.

Figure 7 shows a ruby surface created with the Thin Film shader.

Following are a few settings to create other gemstone surfaces. Feel free to play with various values (Figure 6).

	Gemstone	PrimaryAngle	Ruby	780	-150
Sapphire			430	50	
Topaz			620	-20	
Amethyst			380	70	

11 Now that we've created a few transparent gemstones, let's try some opaque ones. Go back

into Modeler and activate the Ball tool. Open the numeric panel for the tool and raise the Tessellation Level to 3. The sizes you used for the gem should still be in memory, so click OK and then press 'Enter.' Open the Surface Panel and create a new surface named Clear, then click Apply. Copy this object by typing 'c' and then open the Surface Panel again. This time, create a new surface called Stone, and then click Apply. Under the Tools menu, click the Smooth Scale tool. A panel will open asking for an offset. Enter -0.1 mm here and click OK. The entire surface of this ball will now be moved inward by 1/10th of a millimeter. Now, paste the copy we made into the layer. You will now have two balls, one slightly smaller than the other, residing in the same layer. Each ball has its own surface, the smaller one called Stone and the outer one called Clear. This double surface will let us create even more interesting effects.

12 Save this object as SmoothStone.lwo and flip back to Layout. Open the Objects Panel and click the Replace Object button since we still have our gem sitting there. Select the SmoothStone we just created and then open the Surface Panel. We're going to create an iridescent stone here, similar to a

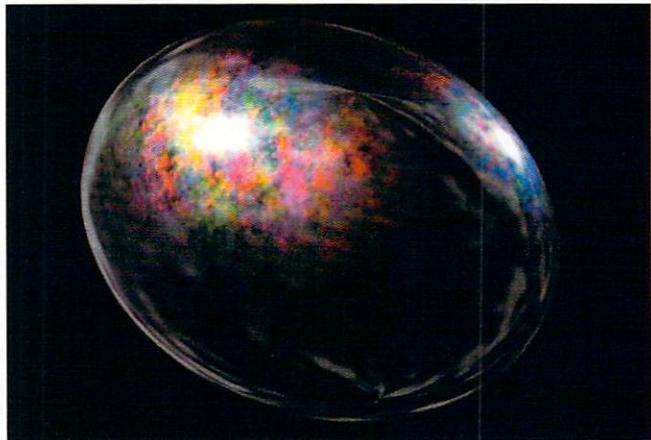


Figure 7. Adding a second layer of polygons creates a clear coat, allowing interesting and powerful surfacing tricks, as seen in this opal.

black opal so select the surface named Stone and change its Surface Color to black (0, 0, 0), which we'll use as a base color. Our other base values will be a Diffuse Level of 20% and a Specular Level of 200%. Change the Glossiness to Low and activate the Color Highlights option. Finally, activate Smoothing, using the default Maximum Smoothing Angle of 89 degrees.

B. As this surface stands, it is completely black, including its highlights, making it very uninteresting. We'll add some points of interest by clicking the Texture button for the Color channel. Select the Fractal Noise Texture Type and give it a Texture Size of 5 mm. Make this surface a bright red and increase the Frequencies to 6. Drop the Contrast to 0.7 and raise the Small Power to 1.0. A preview sample will show a black sphere with a speckled red highlight. Let's add a little more color. Type 'Ctrl-c' to copy this texture and then click the Add New Texture paste the copy in this new layer and change the color to a bright green. A preview sample right now would show a green version of the last sample because our green texture is an exact copy of the red one and sits right on top of it. In order to see the red

texture, lower the Texture Opacity to 50%. Now a 50-50 mix of red and green are visible, but this now results in a yellow pattern because both textures still line up. Click the Texture Center button and type in some random number. This will offset the green texture so the red one can be seen around it. Click the Add New Texture button once again and type 'Ctrl-v' to paste another copy of the red texture here. Change this to a rich blue color, and once again, give this a random Texture Center. Lower the Texture Opacity of this layer to 50% as well. We've just created a three-color fractal pattern that will only show up in the specular highlights of the surface. Click the use Texture button to close this panel.

14. Select the surface we called Clear now, and raise its color to pure white (255, 255, 255). We'll also lower the Diffuse Level to 0% and increase the Specular Level to 100%. Increase the Glossiness to High and raise the Reflectivity to 20%. Click the Reflections Options and set the Reflection Type to Ray Tracing + Spherical Image and select the MetalRefMap.iff image as the Reflected image. Since this surface is called Clear, raise the Transparency to 100%.

Increase the Refractive Index to 1.01 (or higher), and then activate the Smoothing option.

15. This just created an outer clear coat around the Stone surface, which allows us to keep a very smooth appearance to the gem, even if we apply bumps to the surface inside. Currently, the Stone surface has a wide, intense, color highlight that will now have the smaller white highlight of the outer surface located in its center. Type F9 to see the two surfaces interacting with one another (Figure 7).

16. We can make this stone look even more iridescent with the Interference shader. First, select the Stone surface again, and change the name to Fractal Opal, then switch over to the Objects Panel and save the object under that same name. Open the Surfaces Panel and click the Texture button for the Color channel and remove the three fractal textures. Next, raise the base color to a medium gray and lower the Specularity to 100%. Click the Advanced Options tab and select the LW_Interference plug-in. We'll just use the values as they are, except we'll lower the Blend percentage to 20%. Since this plug-in modifies the surface color, our specular highlights will be filtered

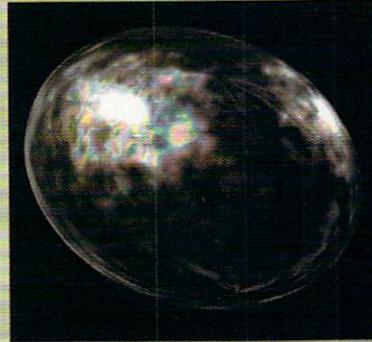


Figure 8. Another version of our opal, this time with a more iridescent appearance.



Figure 9. Iridescence, as applied to this sphere, creates a believable pearl.

Tutorial

according to the viewing angle. This surface is very smooth right now, so what we'll see is simply a series of spectral bands. What we want to do is disturb these bands a little. To do that, click the Basic Parameters tab and click the Bump Map button. Select the Fractal Bumps Texture and give it a size of 1 mm. Increase the Texture Amplitude to 100% and the Frequencies to 6.

Since a bump map changes the angle of the surface normal at each pixel in the image, the effects of the Interference plug-in, or any other plug-in that reads the surface normal (Fast Fresnel, Water, Snow, Thin Film, etc.), will also be modified. A test render will show the formerly even-spaced color bands are now distorted, creating a pearlescent looking effect. (Figure 8)

Speaking of pearls, let's try our hand at one of these. We need to handle these a bit different from the opal since the diffracted colors of pearls is actually located on the surface as opposed to opal, where the colors are reflected from inside.

11. Load the SmoothStone.lwo again and select the Stone surface. The following values will create a good base pearl color for us. It might look a bit dull at first, but

that will change when we set up the pearlescence in the next step.

Color: 210 210 200
Luminosity: 0%
Diffuse: 75-100%
Specular: 50%
Color Highlights: On
Glossiness: 16 (Low)
Reflectivity: 0%
Transparency: 0%
Smoothing: On

Rename this surface as Pearl Base, and then select the Clear surface. Now we'll create our pearlescence.

18. This time, our clear surface will be used to add color to surface behind it. To set it up, use the following settings:

Color: 210 210 200
Luminosity: 0%
Diffuse: 100%
Specular: 50%
Color Highlights: On
Glossiness: 16 (Low)
Reflectivity: 5%
Transparency: 100%
Color Filter: Off
Refractive Index: 1.01
Smoothing: On

For the Reflection Options, Set the Reflection Type to Ray Tracing + Spherical Map and select the FractalReflections image for our Reflection Image.

19. Now we'll add the colors, which will use the same technique we used for the opal. Simply add three Fractal Noise color textures, just as we did in step 13. With the Color Highlights activated, all



Figure 10. Many other effects are possible, including this Tiger's Eye, which requires no plug-ins at all.

we'll see of this transparent surface is a faint color pattern where the specular highlight and any bright reflections are located. We'll finish this surface off by clicking the Advanced Options tab and adding the FastFresnel shader. Open the Shader's interface and change the Reflectivity level to 25% and deactivate the Transparency option.

Now when we render our pearl, we'll get a slight coloration applied around the highlights while the base color shows through the rest of the surface (Figure 9). Also, since both surfaces have a Specular Level of 50%, which is an additive attribute, we actually have the equivalent of 100% specularity.

Well, that covers a few variations on a theme. With two specular highlights like this, endless effects can be created, from pearlescent swirls to crystalline sparkles. In fact, with a bit of playing, virtually any gem type

can be created, from metallic-looking hematite to Tiger's Eye quartz, complete with the "eye" as seen in Figure 10. No, Gaffer is not required for that, but it doesn't hurt either! The secret? That and more are revealed in the upcoming *LightWave Applied*. Hey, I have to save something for the book!

Dave Jerrard is the lead tutorial writer for NewTechniques magazine. He is one of the authors of the upcoming LightWave Applied book (Dec. 1) and will be teaching three LightWave courses at NewTek Expo 1998. His Web site is at www.gsdigital.com/dj.

Be sure to also check out the NewTechniques online bonus section for more tips. The October/November bonus section opens on Nov. 2. The LightWave Applied Web site can be reached at www.advastarbooks.com/lightwave/



Continued from page 23

set Save Project as "Birdies." I usually make a habit of saving my project file in the same place as my scene file so I can back up the whole scene easily.

Once saved, click Continue to return to Particle Storm.

14. Now let's set the relationships between LightWave and Particle Storm. The first of these is to set the Camera settings:

Position :

X: 0m

Y: 0m

Z: 0m

Zoom: 2.6667

And, since we want the camera in Particle Storm to move the same way as the Layout camera we set:

Parent: Camera

If you press the Play button under the preview window you can see the camera mimicking the camera move from Layout. You will also notice that there are particles buzzing around at the origin. Let's fix that.

15. Change the Item Type Popup at the top left to Particle Group and set the following values:

Name: Birdies

Total Particles: 100

Under the Controllers area de-select Death Wish because

it's not polite to kill off our birds. Actually, what Death Wish does is set an arbitrary life span for each particle. This can be good if you want to create a recycling effect like a fountain out of relatively few particles. All you have to do is set the Death Wish time span to kill the particle when it hits the water. It would then get in line to be launched again.

16. Moving down the Item Type Popup select Drag. To create a Drag force on our particles click on Create. Set the Affected Particles to Birdies and make the Drag Strength (3.5 N).

The Drag Strength is the force measurement that it will take to make the particles move from their current position.

If you play the preview now you will see the particles spray out and then hang in the air. This is because there is not a force acting upon the particles yet.

17. Continuing down the Item Type we come to Fountain Emitter. This is the emanation point of our particles. Set the following values:

Parent: BirdLauncher_NO

Initial Speed (min): 0 m/s

Initial Speed (max): 0 m/s

Birth Rate: 40 p/s

Size:

X: 7

Y: 2

Z: 5

Now that the emitter is behind the camera and there are no forces acting on it, the particles will never make it by the camera. The next few steps are going to change that.

18. The Flocking and Swarming Item Type lets you create an item that the particles are drawn to. Generally this is used to create flocks of birds in the air or bees and the like. When doing this, it is not a good idea to let the particles actually attain their goal point but always be seeking it. Therefore, for a true swarm or flock the goal should always be moving.

We on the other hand will be using them as traps to catch our particles in a location of our choosing. To do this we need to make a force strong enough to hold them. Create a Flocking and Swarming force and assign it the following:

Affected Particles

Birdies

Parent: BirdFlocker_NO

Strength (max): 8 N

Leave all other values as they were.

Now if you play the scene you will see the particles making their way to the flocking point. Currently they don't get to the final spot fast enough and they don't have much character to their movement. We fix the speed issues by adding another

flocking point.

19. Click Copy to make another flocking point. Change the following values to make a new flocking point:

Parent: BirdCatcher_NO

Strength (max): 10 N

We made the Strength of this point higher so that the particles will stick in place when they arrive.

Check out the Bonus section of *NewTeknikes* on the Web at www.newteknikes.com/bonus for another tip at solving the boring linear motion to the particles with the addition of some wind. Most importantly, take a bow you have graduated from LightWave 201! Prepare for the next year!

Scott Wheeler is one of three authors of the book LightWave 3D Applied, which hits bookstores on Dec. 1. There will be a book signing at DCC Expo (NewTek Conference) Dec. 2 through 4 at the Los Angeles Convention Center.

Tutorial

A STEP-BY-STEP GUIDE TO CREATING MORE PROFESSIONAL PRODUCTIONS



Using the Bevel and Smooth Shifting tools to produce simple character models.

BY MIKE SORICE

Tools of the Trade Series Smooth Shifting and Beveling To Produce Organic Shapes

In this tutorial, we will look at the Bevel and Smooth Shifting tools, and how they can be used to produce simple character models.

Although our example is fairly simple to illustrate the methods

used, these two tools, in combination with simple manipulation tools like Move, Drag, and Rotate, can produce very complex models limited only by your imagination. So let's get started on making character designs.

Tools:

- Bevel
- Smooth Shifting

Objects in Online Bonus Section:

- bevelSS.lwo

1. First, make a box like you would whenever making a MetaNURBS object. NURBS are the best way to get organic shapes, and the only thing you need to know is how to mold them, and the rest is like sculpting clay.

2. Bevel the bottom poly of the box with Inset and Shift set to 0. Move the selected poly down and shrink it so it is about 3/4 the size it was before. Now bevel the new bottom the same way, and move it straight down.

3. Select the four polys around the bottom section of the

object, but not the bottom face. Smooth Shift them with the Offset set to 0. Shrink the four polygons, then Smooth Shift them again. Enlarge them to the size shown in Figure 3.

4. To continue down, Bevel the bottom poly and move it slightly down and make it larger. Bevel the bottom again and move it straight down without resizing it. This makes up the pelvic area shape. To prepare the leg, bevel the bottom, and resize it so that it is to the left of its original place like in Figure 4.

5. Continue Beveling down the leg, resizing polys to define thicker areas like the knee. To make the pant leg look like it is overlapping the ankle, Bevel the bottom of the leg, shrink it, move it into the leg, Bevel it again, and pull it out.

6. To make the second leg, select the entire leg, but not any part of the hips. Mirror it slightly to the right of the Y-axis. Now, switch to the wireframe preview. Holding the Alt key allows you to rotate the preview. Select corresponding points in the leg and hip (two at a time),

and weld them together.

1. To reshape the torso, move the polys of the larger area further down, resize, and rotate the polys so that the torso is more defined.

8. Smooth Shift the top polys of the torso and pull them up. Next, select the polys where the arms will come out. Smooth Shift them, then use the stretch tool to push them out, forming the arms.

9. After Beveling and pulling out the hand portion of the arm, bevel the end poly, then arrange the corners like in Figure 9. Bevel the center poly again and arrange it so that there are four sections to Bevel for the fingers. Smooth Shift these four to make room for the thumb.

10. Bevel and pull the thumb out of the side of the hand. Pull each finger out of the top where the four separate polys are. Shape and refine the fingers.

11. The last thing to do is Smooth Shift the top of the torso and shrink those polys. Smooth Shift them again and pull them down. To make a neck, Smooth Shift them again and pull them up. Weld points to attach a head.

As with the majority of objects that will be turned into MetaNURBS, it is a good idea to begin with a box. This box will form the torso of our character. Because we will be using the Bevel and Smooth Shift tools to produce more polygons, it is best to start with the smallest number of polys possible. This will give us more control later on. Before moving on, we must understand exactly how these two tools differ from one another.

The Bevel tool takes a polygon and duplicates it either in the same spot as the original was, or by pushing it out. Either way, you end up with five new polygons.

If you Bevel more than one polygon at once, each individual polygon gets raised up and separated from the main object, like the bottom of the box in Figure 1. If you beveled two polygons, you would end up with two humps. That is how Smooth Shifting is different. If you were to Smooth Shift two or more polygons, they would come away from the main object as a whole. We will get to Smooth Shifting in a second, but for now, just bevel the bottom polygon of our box with the Inset and Shift set to 0. Move the selected poly down and shrink it to about 3/4 its original size. Bevel the new bottom and move it down like in Figure 2.

Now we will have a good example of the difference between Bevel and Smooth Shift. Select the four polygons located around the bottom section of our object. Be sure you do not include the bottom face of the object. If you were to Bevel these four polygons, you would get four new polys that went in opposite directions if you were to resize them. This is solved by Smooth Shifting them. Hit Shift+f and set the Offset to 0, then hit enter. Now you can resize the whole rectangular section. Resize it so that it is again about 3/4 its original size. Now Smooth Shift the polys again, and make them large like in Figure 3.

If you were to NURB the object now, you would begin to see the character taking shape. We have a deformed torso and a belt. We will work our way down, and worry about the torso later. For now, select the bottom-most poly and Bevel it, move it down, and make it a little larger. Bevel it again, and move it down again. This gives the pelvic area its general shape, so let's prepare the leg. Bevel the very bottom poly of the object, resize it, and move it so that it is on the left side of where it used to be. Figure 4 shows you where it should be.

Once the beginning of the leg is established, all you have to do is continue to bevel your way down the leg, remembering to resize the polys to be larger at the knee, for example. To achieve the rolled up

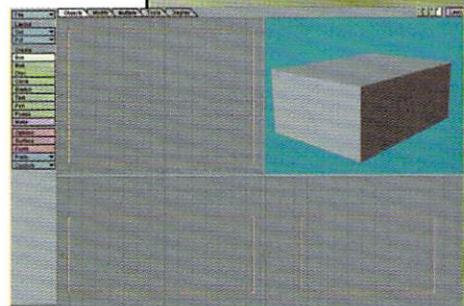


Figure 1

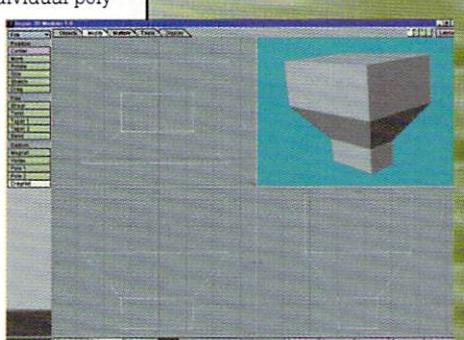


Figure 2

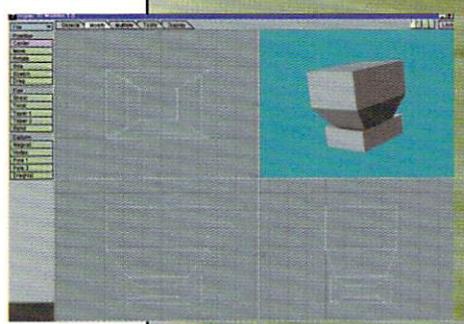


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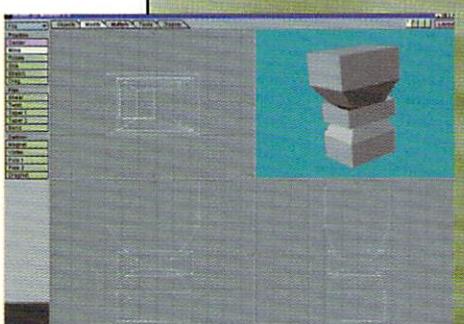


Figure 4

Tutorial

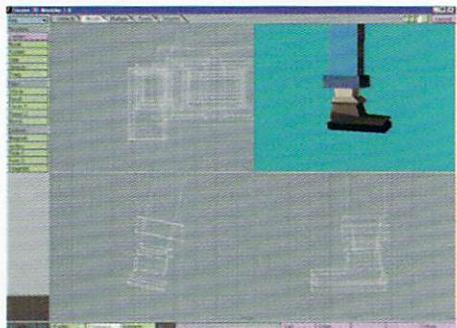


Figure 5

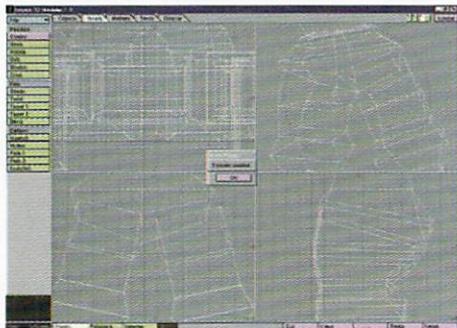


Figure 6

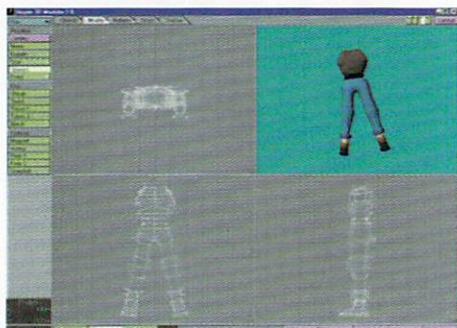


Figure 7



Figure 8

pant leg effect, you must first Bevel the bottom poly, make it smaller, then Bevel it once again, but this time go up instead of down, so that you "suck in" the end of the leg. Bevel it again, pull it out of the hole you have created, and you should be able to continue as you were doing before. Once you have completed the leg, rotate the leg out slightly so that boning will be easier. Now mirror it. Here's how:

Getting the second leg is probably the easiest part of the modeling process. Select the leg (be sure not to include any part of the hips) and mirror it on the Y-axis. It is a good idea to mirror it slightly to the right of the Y-axis so that welding will be easier. Your new leg should end up somewhere around the location shown in Figure 6. Now you must weld the corresponding points on the leg and hips together. To do this, select two points at a time (the corresponding points, of course) and press **Ctrl+w** to weld them together. This will allow the object to be NURBed properly. It helps to use wireframe mode here.

Once we are finished with the legs, we can move on to the torso. First, though, note how the object is coming along when we switch to NURB mode in Figure 7. This is my personal favorite way to model. Do it in standard mode, then switch to NURB mode to see how it looks from time to time. There are instances where this will not work very well, like when modeling a head, but that is a different topic. So here, we have the torso shaped a little better than before. Just move the "shoulder polys" down to where the rib cage would be, and resize them slightly to make sure that it is proportionate to the body.

Now we have to make the shoulders and actually pull out the arms. To do this, we need to first Smooth Shift the top polys in our character's torso and move them up so that we now have polys on each side that can be Smooth Shifted. Select the side polys in the torso that you just made and select the stretch tool (**h** key). Now, in the Face view, place the mouse pointer directly between the shoulder blades. Drag the pointer to the right. This will cause the Smooth Shifted polygons to move outward and define the arms. Then at the ends, Smooth Shift again, shrink the polys, and pull them in like we did to make the pant ends.

After pulling out the polygon inside the sleeve, the next step is creating the hand. The end of the arm where the hand will be is a quadrilateral at the moment, and we need more polys while maintaining three- or four-sided polys for MetaNURBS. The best way to do this is Beveling and Smooth Shifting. First, bevel the end polygon and move it over. Then take the corners in Top view and move them together slightly so that you end up with Figure 9. Next, Bevel the center polygon and respace the corners so that you end up with four segments (place the fifth so it is out of the way—we won't need it).

Now to model the fingers. First, Smooth Shift the four sections you made and move them out a bit. For the thumb, we can use one of the polys on the side of the hand. Just Bevel it out and shape it like the rest. Now do the same to the four polygons on the edge of the hand. After you reshape the fingers, we can do the same as we did with the leg and mirror the hand. Again, select the hand, and mirror it slightly to the right of the Y-axis. Then just weld the corresponding points together as we did in Figure 6. Our model is complete with the exception of one thing: defining the neck.

Defining the neck so we can place a head of our choice on the model is very

simple. Simply Smooth Shift the top of our model's torso, and pull it up a bit while shrinking it slightly. Then, all there is to do is to Smooth Shift it and move it down. You can also Bevel it and pull it up to form a neck, but since we had our own head, we chose simply to Weld it on instead.

The steps here are simply a reference for techniques involved in character modeling. Once you completely master Beveling and Smooth Shifting, there will be very few organic shapes that you cannot model.

Mike Sorice is an epic software group artist.



Figure 9

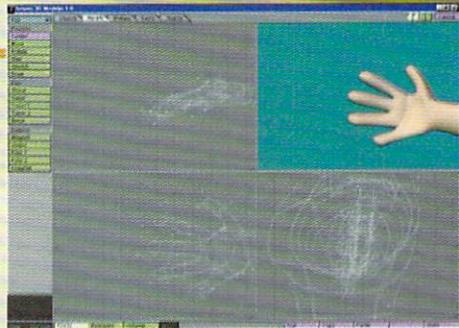


Figure 10

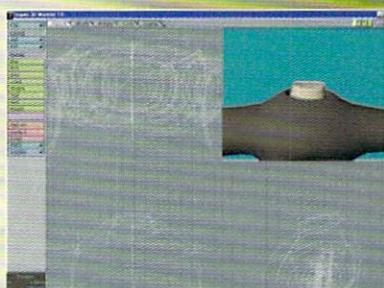
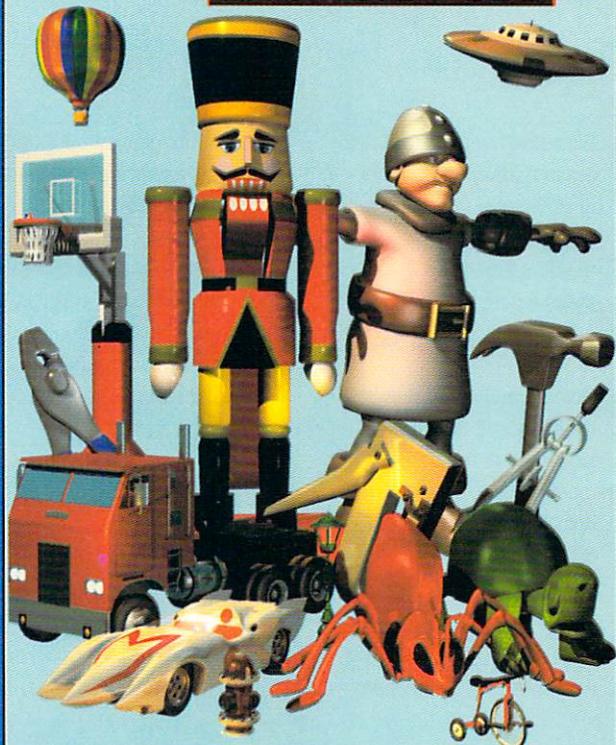


Figure 11

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Tutorial

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Getting the indoor
light just right.

BY MIKE SORICE

Tools of the Trade Series Indoor Lighting Techniques

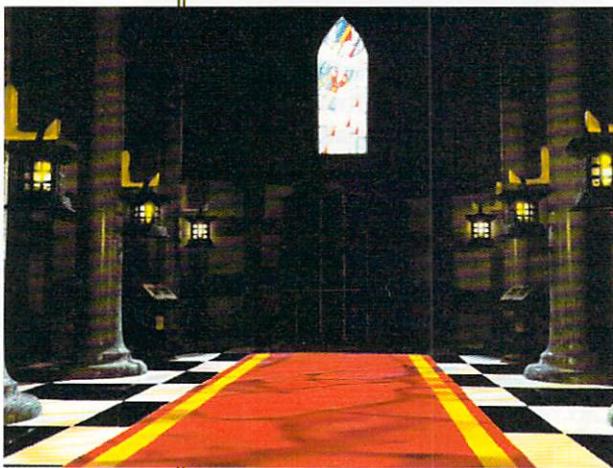
When people start working with 3D programs, they generally tend to use a large amount of ambient lighting that looks very artificial. No matter how complex the models are, they will not look as good as they could unless the scene is lit properly. Although ambient lighting is useful outdoors, it rarely makes the scene come alive indoors. In this tutorial, we will look at some of the aspects of realistic indoor lighting including point light options, glow effects, and image projection with lights.

Tools

- Lens Flare
- Glow Effect
- Light Projection Images

Objects in Online Bonus Section

- window.lwo
- castle.lwo



1. Place the lights so that they are in their appropriate place in the scene. In other words, place the point lights where the lamps are, and the spot-lights where the window is.
2. Give lights 1 through 8 30% Intensity and 30% flare intensity. Refer to the right for more details. Give one spotlight 60% Intensity, and the other 100%.
3. Find a stained glass texture (high resolution) and apply it
4. Position the light with 100% Intensity so that it will hit the portion of the floor that the camera can see clearly. Give the light the dovermap.bmp as a Projection Image. Set the Glow Effect to 100% Intensity, and the radius to 13 pixels under the Image Processing tab.

as an image map onto the windowglass surface. Set the glow effect to around 10%.

The first, and most obvious step in setting up the lighting is placing the lights in a manner that will replicate the light coming from the lamps and the window. For the lamps, it is most effective to use point lights, but for the window, place two identical spotlights next to each other. One of the lights will be used as a source of light, and the other will be used to project the image of the stained glass onto the carpet below. Since spotlights originate from one point, it will supply much more realistic lighting than ambient lighting. Figure 1 shows where the lights were placed in our scene.

Figure 2 shows the Light panel for light 9. Here is what to do with the rest of them: Lights 1 through 8 are the point lights that are located in the lamps throughout the room. They have an intensity of 30% and a light-orange color to simulate the flames when reflected on the glossy tiled floor. They also have an Intensity Falloff with a maximum range of 15 m. As for their lens flare options, they have 30% Flare Intensity, and they have two boxes checked: Central Glow and Glow Behind Objects. The two lights near the window have 100% and 60%. They have no Lens Flare, or Intensity Falloff.

In Figure 3, you see the image that was used as the image map on the window and as the projection image for one of the spotlights. Load the window object into Modeler, and note that the glass has its own surface. In the Surfaces panel, press the "T" next to Surface Color for the windowglass surface. Select Planar Image map, go to the box where it says Texture Image, and select load. Locate the dovemap.bmp, and be sure Z-axis is highlighted. Click on Use Surface, and then go to the Advanced Options tab. Set the Glow Effect to about 10%. This will make the glass look backlit.

Now go back to the Lights panel. Select the light that has 100% intensity. Near the bottom of the panel, there will be a pull-down box for a Projection Image. Pull it down, and select the window image. Also, notice the positioning of the light in Figure 4. It is important to project the Projection Image on the floor in a manner that it is visible to the camera. If the angle is too sharp, the image will be spread across the floor, and will look deformed. Finally, go to the Effects panel and then the Image Processing tab. Click on Enable Glow Effect, and set the Intensity to 100% and the Glow Radius to 12 pixels.

Michael Sorce is a 3D animator at epic software group, inc. and has written several tutorials on Inspire 3D. In addition to the tutorials included in NewTekniques, he has written the majority of the tutorials for www.3dinteractive.com.

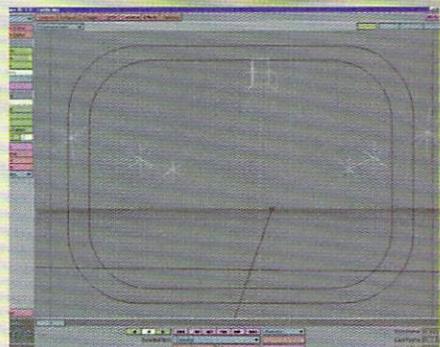


Figure 1



Figure 2

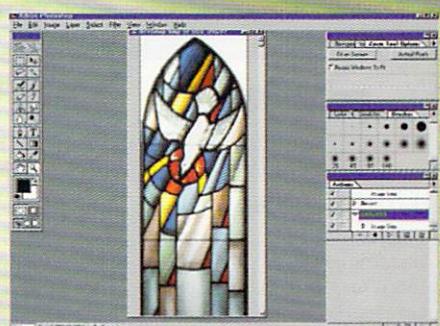


Figure 3

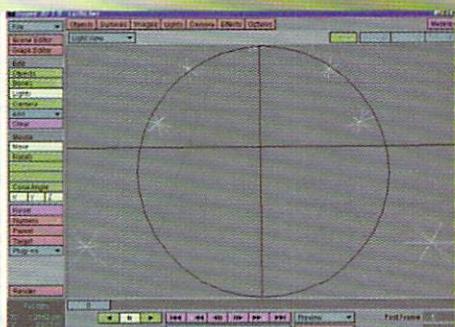


Figure 4

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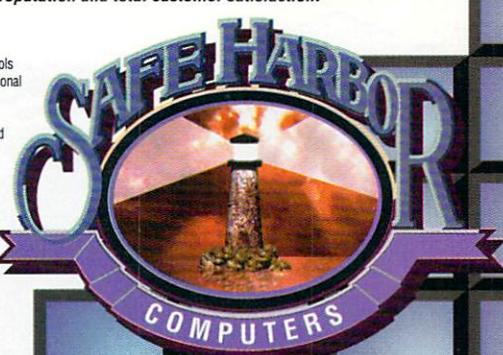
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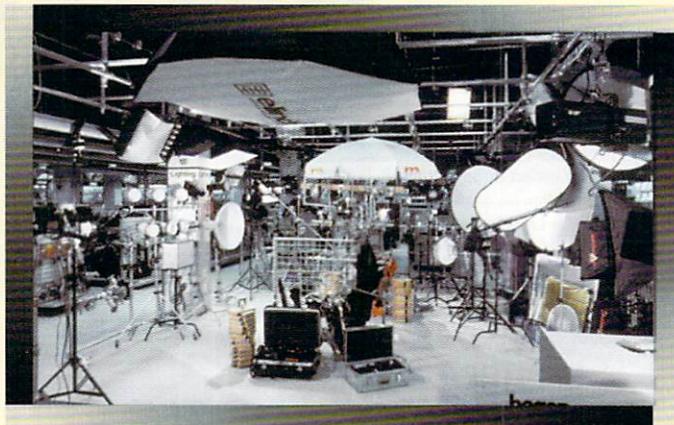
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- Digital Image Stabilizer for clear, shake and jitter free shots.
- 12X optical zoom as well as 30X and 120X digital zoom functions. Move from wide-angle to full zoom in 1.3 seconds allowing quick framing while in REC pause.



- Offers six digital effects: Wipe, Mix, Strobe, Gain-Up, B&W and still mode.
- Large-diameter focus ring enables a high level of focusing precision. A Multi-Function Push Dial allows easy setting of the 16-step iris, 5-step gain control (+12dB maximum) and 14-step shutter (up to 1/8000 second). Mic input level can also be set in steps (+20/-10/0/+3/-6 dB).
- Five program AE modes for shooting in a variety of different conditions. There is also a five-mode white balance: Set, Fluorescent, Auto, Indoor and Outdoor.

Canon

XL-1

3-CCD Camcorder

with Interchangeable Lens Mount

With 3-CCDs, exclusive interchangeable XL Lens Mount System, unmatched optical technology, SuperRange Image Stabilizer, DV and simultaneous four channel audio recording, the XL-1 offers unmatched image quality and shooting versatility.

Interchangeable XL Lens Mount System

- Interchangeable XL lenses for unsurpassed flexibility and superior range. XL lenses incorporate the highest quality, multi-coated optics to achieve 600 lines of resolution.
- In addition to the standard 16:1 lens, there is an optional 16X telephoto lens, a 1.6X extender and an EF to XL adapter.
- 16:1 Optical Zoom with SuperRange Image Stabilizer

The 16:1 has a focal length range of 5.5 to 88mm (35mm equivalent of 39 to 633mm). It offers variable speed zoom, manual zoom and manual focus control and has a one-push auto-focus button and built-in 1.5X ND filter.

Besides a gyro sensor, the SuperRange Optical Image Stabilizer uses a motion vector to examine the image after it is received by the CCD to detect any shake missed by the gyro. Data is then fed back to refine the movement of the vari-angle prism resulting in the most advanced stabilization system available today.

Digital Audio

- Three digital audio modes (16 bit and two 12 bit modes) and simultaneous recording of four separate tracks. You can output each signal independently.
- Audio inputs with independent level controls.
- Optional MA-100 Mic Adapter/Shoulder Pad allows use of two XLR mics and allows shoulder mounted shooting.



3-CCDs

- Three 270,000 pixel CCDs with advanced Pixel Shift technology achieves 530 lines of resolution.
- Large 72 micron CCDs deliver a 4dB improvement in sensitivity. Vertical smear is also dramatically reduced.

Three Recording Modes:

- High resolution full motion video (Normal Movie Mode)
- High resolution stop action images of moving subjects (Frame Movie Mode)
- Perfect stills (Digital Photo Mode).

Unique Design & Dual Action Shooting Handle

- In addition to the normal side grip, the handle includes an additional start/stop switch and zoom control for dual-action shooting.

Additional Features:

- 180,000-pixel color viewfinder
- Zebra pattern and color bar generator
- Automatic and manual white balance, gain (five preset levels from -3 to +12dB) and exposure lock.
- Composite, S-Video output, DV (IEEE 1394) in/out, Control L
- Digital fader and wide screen TV effect
- Headphone jack with level adjustment
- Remote control with jog/shuttle dial



PHOTO - VIDEO - PRO AUDIO

SONY

DSR-200A

3-CCD Digital (DV) Camcorder

Combining a compact and lightweight body with the superior picture quality of DSP (Digital Signal Processing) and the DV format, the DSR-200A is the ideal acquisition tool for video journalists, event and wedding videographers, stringers and production houses. 500 lines of horizontal resolution, 48kHz or 32kHz digital audio, three hour record time, and minimum illumination of 3 lux is only the beginning. Other features include 16:9/4:3 capability, Steady Shot, high resolution 1-inch viewfinder, time code operation, time/date superimposition and an IEEE-1394 interface for direct digital output. Offers full automatic as well as manual control of focus, Iris, gain, white balance and shutter speed.

- Variable servo 10X optical power zoom lens goes from 5.9mm to 59mm in 1.7 to 24 seconds. The manual zoom rocker is continuously variable right up to where the digital 20X zoom kicks in.
- Sony's Super Steady Shot reduces high frequency camera shake without compromising image quality. SteadyShot uses horizontal and vertical motion sensors that allow it to work accurately while zooming, moving (even shooting from a car), and shooting in low light conditions.
- Has digital effects including audio and video fade, overlap and Slow Shutter.
- Automatic and manual focus, Iris, shutter, gain and white balance. Iris is adjustable in 12 levels from F1.6 to F16, shutter from 1/4 to 1/10,000 of a second in 12 steps, Gain from -3dB to +18dB in 8 steps.
- Zebra Pattern indicator, built-in ND filter.
- Custom Preset function lets you preset, store and recall custom settings for color intensity, white balance (bluish or reddish), sharpness and brightness.
- Stores Photo, Date/Time, Shutter Speed, Iris, Gain and F-stop for easy recall. So if you have to re-shoot, you know your original settings for every scene and frame.

DSR-200A Field Package:

- DSR-200A Camcorder • NPA-1000/B Battery Case Adapter
- 3 NP-F930/B 7.2v 4000 mAH Batteries
- AC-V900/B AC Adapter, Triple Battery Charger
- VCT-U14 Tripod Adapter • LC-2000CP System Case



DSR-30 DVCAM Digital VCR

The DSR-30 is an industrial grade DVCAM VCR that can be used for recording, playback and editing. DV standard 4:1 sampling digital component recording with a 5:1 compression ratio provides spectacular picture quality and multi-generation performance. It has a Control L interface for editing with other Control L based recorders such as the DSR-200A DVCAM Camcorder or another DSR-30. It also has a continuous auto repeat play-back function making it ideal for kiosks and other point of information displays. Other features include high quality digital audio, IEEE-1394 Digital interface and external timer recording. The DSR-30 can accept both Mini and Standard DVCAM cassettes for up to 184 minutes of recording time, and can playback consumer DV tapes as well.

- Built-in control tray has a jog/shuttle dial, VCR and edit function buttons. The jog/shuttle dial allows picture search at ±1/5 to 15X normal speed and controls not only the DSR-30 but also a player hooked up through its LAN interface.
- DV In/Out (IEEE 1394) for digital dubbing of video, audio and data ID with no loss in quality.
- Analog audio and video input/output make it fully compatible with non-digital equipment. Playback compatibility with consumer DV tapes allows you to work with footage recorded on consumer-grade equipment. Tapes recorded in the DSR-30 are also compatible with Sony's high-end DVCAM VCR's.



PVM-14N1U/14N2U & 20N1U/20N2U

13-inch and 19-inch Presentation Monitors

With high quality performance and flexibility, Sony's presentation monitors are ideal for any environment.

They use Sony's legendary Trinitron CRT and Beam Current Feedback Circuit for high resolution of 500 lines as well as stable color reproduction. They also accept worldwide video signals, have a built-in speaker and are rack mountable. The PVM-14N1U/20N1U are designed for simple picture viewing, the PVM-14N2U and 20N2U add RGB input and switchable aspect ratio.

They Feature:

- 500 lines of horizontal resolution
- They handle NTSC, NTSC 4.43, PAL, and SECAM.



- Picture (chroma, phase, contrast, brightness) and setup adjustments (volume, aspect ratio) are displayed as easy-to-read on screen menus.
- Closed captioning is available with the optional BKM-104 Caption Vision Board.

PVM-14N2U/20N2U Only:

- (Last Input Switch) - Contact closure remote control allows you to wire a remote to an existing system so that the monitor's input can be remotely controlled to switch between the last previously selected input and the current input.
- 4:3/16:9 switchable aspect ratio

PVM-14M2U/14M4U & 20M2U/20M4U

13-inch and 19-inch Production Monitors

Sony's best production monitors ever, the PVM-M Series provide stunning picture quality, ease of use and a range of optional functions. They are identical except that the "M" models incorporate Sony's state-of-the-art HR Trinitron CRT display technology and have SMPTE C phosphors instead of P22.

- HR Trinitron CRT enables the PVM-14M4U and 20M4U to display an incredible 800 lines of horizontal resolution. The PVM-14M2U and 20M2U offer 600 lines of resolution. M4 models also use SMPTE C phosphors for the most critical evaluation of any color subject.
- Dark tint for a higher contrast ratio (black to white) and crisper, sharper looking edges.
- Each has two composite, S-Video and component input (R-Y/B-Y, analog RGB). For more accurate color reproduction, the component level can be adjusted according to the input system. Optional BKM-101C (video) and BKM-102 (audio) for SMPTE 259M serial digital input.

- Beam Current Feedback Circuit
- 4:3/16:9 switchable aspect ratio
- True multi-system monitors they handle four color system signals: NTSC, NTSC 4.43, PAL, and SECAM.
- External sync input and output can be set so that it will automatically switch according to the input selected.
- Switchable color temp, 6500K (broadcast), 9300K (pleasing picture), User preset, (3200K to 10000K).
- Blue gun, underscan and H/V delay capability
- On-screen menus for monitor adjustment/operation.
- Parallel remote control and Tally via 20-pin connector.





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SONY

UVW-1400A Betacam SP Recorder

The UVW-1400A is a non-editing VCR which deliver Betacam SP quality and offer features for a wide range of playback and recording applications. RGB and RS-232 interface make it especially ideal for large screen, high quality video presentation, scientific research and digital video environments.

- Ideally suited for work in computer environments, because RGB signals can be converted into component signals and vice versa with minimum picture degradation.
- 25-pin serial interface allows external computer control of all VCR functions based on time code information. Baud rate can be selected from between 1200 to 38,400 bps.
- Built-in Time Base Stabilizer locks sync and subcarrier to an external reference signal as well as provides stable pictures.
- Built-in LTC Time Code and UB (User Bits) reader/generator
- Equipped with two longitudinal audio channels.

UVW-1700G

Betacam SP Computer Graphics Frame Recorder

The UVW-1700G has all the features of the UVW-1400A (except foot switch control) plus it adds frame accurate video insert editing capability as well as RS-232 and RS-422 interfaces. These make the UVW-1700G ideal not only for conventional video program production but also for animation and computer graphics creation.

Same features as the UVW-1400A PLUS—

Uniquely equipped with both RS-232 and RS-422 serial ports for versatile system integration. Both serial ports are easily accessed via the set-up menu. Built-in time code capability combined with sophisticated servo servo system ensures frame accurate insert editing (video only) when connected to computer-based editing systems (via RS-232 port) or RS-422 equipped edit controllers. Ideal VCR for animation and computer graphics creation, where frame-by-frame editing is indispensable.



UVW-1800 Betacam SP Editing Recorder

All the features of the 1400A PLUS—

- Optional UVR-60 allows remote TBC adjustment.
- RS-422 interface for editing system expansion.
- Two types of component output: via three BNC connectors or a Betacam 12-pin dub connector.

- Frame accurate editing is assured, thanks to sophisticated servo control and built-in time code operation. In the insert mode of the UVW-1800, video, audio Ch-1/2 and time code can be inserted independently or in any combination.



GENESIS^{vfx}

Special Effects and Lens Flare Plug-in for LightWave 3D and Studio MAX

Genesis^{vfx} is a revolutionary special effects plug-in that takes basic properties of physics and harnesses them for use in both still and animated rendering. Genesis^{vfx} can create lens flares, sparkles, glows, heat distortions, 3D particle clouds, gas clouds, explosions, and even flowers with complete animation control over every aspect of the effect. Genesis^{vfx} eliminates the usual limitations of most comparable packages—point light sources or complex object linking are no longer necessary. With Genesis^{vfx} you can link any number of objects of any type. The possibilities are limited only by your imagination! And this power has not been added at the expense of program complexity, indeed there are no lists of parameters with cryptic names and wherever possible real time previews are available to reflect the changes being made.

For LightWave 3D (Intel) \$319.95 3D Studio MAX \$339.95
For LightWave 3D (Alpha) \$369.95 For Photoshop (PC or Mac Specify) \$149.95



DISK ARRAYS for Mac and Windows NT



Using ATTO PCI Ultra SCSI accelerator cards and Seagate Ultra SCSI 16-bit hard drives, CTI disk arrays provide high data rates of up to 80 MB/sec to ensure smooth clean video without dropped frames. Especially designed for audio and video applications, Seagate disk drives employ embedded servo technology, eliminating the need for thermal recalibration. CTI disk arrays are fully tested for Windows NT and Power Macintosh systems and are available in fixed and removable configurations. With arrays from 8GB to 36GB and up to 180GB when daisy chained, CTI delivers the flexibility, performance and reliability at a price you can afford.

- Plug and Play • Hot swappable canister • Multiple large power supplies • Efficient cooling and airflow
- ATTO RAID striping software for Windows NT or Macintosh • 68-pin active terminators and 68-pin system cables
- Push button SCSI ID selector • All arrays come with a five year limited warranty.

2 Bay Tower Fixed

CTI-8FS 8.4GB Array with 2 Seagate Barracuda 4.2GB Ultra Wide drives (#ST34572W) and ATTO Single Channel SCSI card (28.2 MB/s sustained transfer rate) **1699.95**

CTI-18FS 18.2GB Array with 2 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and ATTO Single Channel SCSI card (28.2 MB/s sustained transfer rate) **2115.00**

4 Bay Tower Removable

CTI-8RS 8.4GB Array with 2 Seagate Barracuda 4.2GB Ultra Wide drives (#ST34572W) and ATTO Single Channel SCSI card (18.2 MB/s sustained transfer rate) **2117.95**

CTI-18RS 18.2GB Array with 2 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and ATTO Single Channel SCSI card (28.2 MB/s sustained transfer rate) **2529.95**

2 Bay Tower Removable

CTI-72RS 7.2 GB Array with 4 Seagate Barracuda 18.2 GB Ultra Wide drives (#ST18273W) and ATTO Single Channel SCSI card (28.2 MB/s sustained transfer rate) **7380.95**

CTI-72RD 7.2 GB Array with 4 Seagate Barracuda 18.2 GB Ultra Wide drives (#ST18273W) and ATTO Dual Channel SCSI card (39.9 MB/s sustained transfer rate) **7974.95**

4 Bay Tower Removable

CTI-72RS 7.2 GB Array with 4 Seagate Barracuda 18.2 GB Ultra Wide drives (#ST18273W) and ATTO Single Channel SCSI card (39.9 MB/s sustained transfer rate) **7974.95**

CTI-72R2S 7.2 GB Array with 4 Seagate Barracuda 18.2 GB Ultra Wide drives (#ST18273W) and 2 ATTO Single Channel SCSI card (46.4 MB/s sustained transfer rate) **7732.50**

CTI-36RS 36.4 GB Array with 4 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and ATTO Single Channel SCSI card (28.2 MB/s sustained transfer rate) **4759.95**

CTI-36RD 36.4GB Array with 4 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and ATTO Dual Channel SCSI card (39.9 MB/s sustained transfer rate) **5345.50**

CTI-36R2S 36.4GB Array with 4 Seagate Barracuda 9.1GB Ultra Wide drives (#ST39173W) and 2 ATTO Single Channel SCSI card (46.4 MB/s sustained transfer rate) **5112.95**



NewTek

LIGHTWAVE 3D 5.5

3D Rendering and Animation Software for Broadcast Graphics

LightWave 3D is the easy way to create the most sophisticated 3D animation imaginable. It's intuitive, complete, easy-to-use layout and modeling system deliver the ultimate in creative control, not to mention flexibility. Unparalleled features for modeling, surfacing, lighting and animating are right at your fingertips. Raytracing, motion blur, MetaMation, inverse kinematics (IK), Bones, field rendering, lens flares, compositing - they're all here. And with OpenGL and QuickDraw 3D support you can see your creations in real time. Add a robust plug-in architecture, and it's no wonder you find LightWave 3D in more Hollywood animation suites than any other 3D program. LightWave 3D is available for almost platforms: Windows 95, Windows NT, Power Mac, DEC Alpha, SGI and Sun Microsystems.

LightWave 3D 5.5

	For PC (Intel)	1599.00	From Intel 5.0.....	449.00	From Intel 4.0.....	599.00
For PC (DEC Alpha).....	1599.00		From DEC Alpha 5.0.....	449.00	From DEC Alpha 4.0.....	599.00
For Macintosh.....	1899.00		From Macintosh 5.0.....	549.00		
For SGI.....	2499.00		From SGI 5.0.....	899.00		

Upgrades from LW 5.0 to 5.5

	Upgrades from LW 4.0 to 5.5
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From DEC Alpha 5.0.....	449.00
From Macintosh 5.0.....	549.00
From SGI 5.0.....	899.00

Upgrades from LW 4.0 to 5.5

INSPIRE 3D

3D Art and Animation Software for Graphic Artists, Multimedia Developers and Web Designers (For Mac or PC)

Specifically designed to meet the demand of the graphics pro, Inspire 3D is a powerful program that lets you add a whole new dimension to your work by creating stunning print images, dynamic multimedia productions and slick web visuals that just aren't possible in 2D. With Inspire 3D, you can model, animate and render 3D elements in any style and complexity. By adding texture, motion, lighting effects and more, your print materials will almost pop off the page. Use the images you create as single frame print graphics or as lower resolution animation files for multimedia or the web or choose from a library of pre-created images. And use the photorealistic or stylized animation images you create for real-time graphics applications, including VRML 2.0, for all kinds of projects.

- Compatible with Photoshop, QuarkXPress, Illustrator, Freehand, Director, and more. Create simple or complex animations, transform Illustrator files into animated 3D graphics, create killer photorealistic 3D or cartoon-style images and use pre-created or custom modeling.
- Supports 16 image and seven 3D model formats, gives you your choice of output with resolutions up to 8,000 x 8,000.
- Expandable modeling capabilities and a ton of plug-ins for specialized functions. Features like Spline-based modeling and MetaNURBs let you mold and manipulate objects in ways you never could before, then output them as hi-res images - fast. Use Inspire's library of designer images, create your own - or mix the two for interactive content, games, training materials and movies.
- Quickly and easily create brilliant single and composite images and animations to design exciting web sites.
- Uses LightWave 3D's formidable rendering engine to put true photorealistic capabilities right on your desktop. Gives your 3D images the edge you're looking for.

Inspire 3D for Windows

385.00

Inspire 3D for Macintosh

385.00

Adobe AFTER EFFECTS 3.1

Compositing, Motion Graphics & Special Effects for Mac or Windows

After Effects 3.1 provides the power and features required by film makers, video producers, editors, graphic designers, multimedia professionals and web developers to produce unlimited composites, fluid animations and sophisticated special effects. Available for Mac and Windows, After Effects is tightly integrated with the Adobe product family, so if you work with Premier, Photoshop, or Illustrator, you already have the skills, shortcut know-how, and hardware to make After Effects a seamless, powerful extension of your creative arsenal. Turn your computer into a motion-graphics studio and put awe-inspiring action into your work.

SOPHISTICATED COMPOSITING:

- Combine digitized materials from any source to create sophisticated composites and traveling mattes using transparency, complex masks and alpha channels. Animate Photoshop layers and Adobe Illustrator art with direct import capabilities.

MOTION GRAPHICS:

- Position and animate layers with unlimited keyframes and sub-pixel accuracy. View and edit your spline-based motion paths on-screen. Ensure super smooth motion at any speed with field-rendering and true motion blur.

SPECIAL EFFECTS:

- Use use plug-in effects ranging from precise color correction filters to wipes and blurs, and even Photoshop filters. You can also animate each effect independently over time.

AFFORDABLE QUALITY:

- Create anything you can imagine. Get top-quality motion graphics for film, broadcast or CD-ROM — at a fraction of the cost of a dedicated system.



Adobe After Effects 3.1

Artel Boris Effects 3.5

A multi-channel DVE generator, complete with intraframe interpolation, matte manipulation, and multiple keyframes, Boris Effects lets you to create your own custom moves. Boris ships with a keyframe library of over 150 customizable effects including cubes, picture-in-picture, chroma keying, tilting soft edges, masks, filters and compositing of unlimited track of video and graphics. Effects can be saved or used with different video source clips. Create 3D flying logo effects from PICT, TIFF, bitmap, VIW and QuickTime files using an embedded alpha channel. Other features include borders and drop shadows which can be colored and made soft and translucent, as well as control over camera position and light source with specular highlights. Based on a plug-in architecture, Boris closely integrates into all of today's popular non-linear systems. Once installed, it is easily accessed from their transitions and filters menu. It is not a background application and no extra memory is required.

- Blur and bevel filters.
- Control of image scale (size), positioning, depth and opacity.
- 3D effects with depth control to create cubes or slabs with up to 6 different videos, pics or colors on each of the 6 faces.

For Adobe After Effects (Specify Mac or Windows NT) **.349.95**

For Adobe Premier (Specify Mac or Windows 95/NT) **395.00**

For Ulead Media Studio Pro 5.0 **395.00**

For Fast VM-Studio Plus **395.00**

For insync Speed Razor **395.00**

- Variable pivot points for rotation control.
- Add keyframeable specular and ambient light to your effect.
- Cropping with full softness control of the edges and blend for really smooth soft wipe type of effects.
- Includes a free year of upgrades and full tech support!

For Media 100 **549.95**

For Avi MCXpress NT **549.95**

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PVR-2500

'Perception' Digital Video Recorder

The Heart of an Advanced Digital Audio/Video Workstation

The PVR-2500 offers powerful features for awesome animation, morphing and rotoscoping capabilities. With features like 720 x 480 resolution, 10-bit 2x oversampled video encoding, better than D1 scaling, component and S-Video outputs, multi-processor support and integrated FAST SCSI-2 controller, it empowers your computer to rival the finest professional production studios.

- Full-length PCI card with integrated FAST SCSI-2 controller.
- Multi-format virtual file system ensures complete integration with your Windows NT applications. Any acquired video or computer generated Perception video clips appear simultaneously in many different file formats including TARGA, SGI, BMP and IFF. Perception is compatible with Lightwave 3D, Studio Max, Softimage and others.
- Performs real-time interpolation of 30 fps video to 24 fps film rates or vice versa. This means that it is also at home on the Hollywood movie set as well.
- Outputs broadcast quality 720 x 480 resolution. Dynamic range is in excess of D1 scaling so images are brighter, have more color and greater spatial resolution than ever before. Component, composite and S-Video outputs are provided via the included breakout cables.
- VCR control simplifies the task of batch digitizing and recording. In this mode, the PVR-2500 can read SMPTE time code from the source deck.



- Includes DPS Lockstep plug-in to provide significant control over 3D Studio MAX
- Coupled with the AD-2500 component video capture card, the PVR-2500 becomes a broadcast-quality digital disk recorder. It delivers unsurpassed picture quality, and storage capacity is limited only by the size/number of attached SCSI hard drives.
- The AD-2500 has component, composite and S-Video inputs for real-time recording. Captured video can also be exported as sequential RGB files for rotoscoping and other compositing applications
- When used with the AD-2500 capture card, a sound card, editing software & one or more SCSI drives, the PVR-2500 becomes a non-linear editor of unparalleled performance – an unbeatable price.



Post-Production System on a Single PCI Card

Based on Pinnacle's EMMY award-winning special effects technology, GeniePlus is a complete desktop post-production system that includes a 3-D DVE/switcher, advanced character generator, fast still-store and a dynamic paint system – at a price you can afford. Equipped with an incredible array of features on a single PCI card, GeniePlus lets you create your own stunning effects, including page turns, water ripples and spheres with uncompromised 4:2:2 digital quality. The full-function 3-D DVE provides ultra-smooth motion and no breakup (pixelation) when pictures are sized or rotated. You'll be able to create exciting warp effects with lighting, trails, shadows and borders faster and easier than ever before.



DC-30 plus PCI Capture Card for Windows 95/NT

The DC30 plus lets you capture, edit, add special effects or titles to your video, mix CD-quality audio, and then output the final cut to video tape. The DC-30 also offers fast plug and play installation and easy to use software so you'll be producing studio quality video in minutes. It even analyzes your system and automatically configures itself to provide the optimum video quality.

- The DC-30 is a PCI Bus mastering card that delivers a 6MB per second sustained video data transfer rate for high quality video capture. PCI Bus mastering ensures CPU bottlenecks don't impede the performance of the PCI bus, thereby limiting the reachable video transfer data rate.
- 2:4:1 compression ratio (adjustable up to 32:1). A lower compression ratio means a better final video image quality. Compression ratios under 4:1 are considered to be "broadcast quality."
- Real-time video overlay displays the video in real-time on the computer monitor during capture and video editing process eliminating the need for an external video monitor.
- Full NTSC, PAL, SECAM, PAL M for worldwide compatibility.



- Audio and video capture is synchronized to achieve perfect lip-sync. (Capture from 8-bit mono 11kHz to 16-bit stereo 44.1kHz)
- Hardware acceleration of Adobe Premiere provides almost instant display of video "thumbnails" in the construction window (under one second). Acceleration also reduces the time to create "previews" and final video clip with "make movie".
- Bundled with Adobe Premiere 4.2 full version, Photoshop 3.05 LE and Asymmetrix 3D/FX animation software.

DC-30 plus for Windows 769.00
NEW! DC-50 Same as DC-30 plus with component in/out 1699.00

Miro DC-30 plus Turnkey System:

- 220-watt midtower case • Pentium 233 MHz MMX processor • PCI motherboard with 512K cache
- Diamond Stealth 3D 3000 4MB DRAM PCI display card • 64MB of RAM • Quantum 3.2 GB IDE system drive
- Seagate Barracuda 9GB SCSI-2 FAST/Ultra-wide hard drive • Adaptec AHA-2940UW FAST/Wide SCSI-2 controller • 3.5" floppy drive • Teac CD-532E 32X EIDE internal CD-ROM drive • Altec-Lansing ACS-43 2-piece speaker system
- Focus 2001A keyboard • Microsoft MS mouse • Viewsonic G771 17-inch 1280 X 1024 SVGA monitor
- Windows 95 • Miro DC-30plus video/audio capture card • Adobe Premiere 4.2 (full version) editing software, Adobe Photoshop 3.05 LE imaging software and Asymmetrix 3D/FX animation software \$3495.00

\$3495.00

DV-300 IEEE 1394 Digital Video Capture Card

A digital video capture, editing, and playback solution for Windows 95/NT and Macintosh, the DV-300 is built around an intuitive software application that offers frame-accurate DV camera control, uncompromised image quality, and the ability to intelligently search digital videotapes for individual scenes. Additionally, the DV300 differentiates itself by providing a built-in SCSI port for connection to high speed drives.

DV-300 Hardware:

- PCI board with bus mastering interface
- Includes 1394 cable
- One internal and two external DV connections

DV-300 DVTools Software:

DVTools automatically scans the DV tape and finds scene in and out points. The Camera Controller allows for previewing before down loading any data. Scene locations with timecode are organized in the drag-and-drop Capture Gallery. Scenes can be trimmed so only the video you want is captured, saving you valuable hard drive space. Once you have arranged the scenes to edit, DVTools will automatically cue the camera and capture them.



DV Master

Unlike software-based DV systems that can be as slow as six times real-time, DV Master incorporates Sony's DVBK-1 DV hardware CoDeC to guarantee lossless transmission at top speed. With just one cable you can transfer video, sound and machine control signals in real-time. Also allows the display of video during "capture", as well as at any time during the editing process. You can scrub in or trim the timeline, and then preview it in real-time at full-screen, full-motion on your video or computer monitor.

Another advantage of having the Sony DVBK-1 on the board, is that it allows the DV Master to act as a real-time video transcoder. Using the supplied break-out box, you can simultaneously convert analog composite, S-Video and component into digital and vice versa. This is ideal for archiving analog footage onto digital as well as for mixing analog and digital footage when editing. It also allows you to transfer edited digital footage directly to S-VHS or Betacam SP without having to first go back to the camera.

Bundled Software:

Includes Sonic Foundry Sound Forge audio editing software, and a choice of editing software: Ulead MediaStudio Pro 5.0, full version of Adobe Premier 4.2 or special version of in:sync Speed Razor MACH 4.



canopus DVReX-M1

The Complete DV Digital Video Editing System

The DVReX-M1 is a hardware and software bundle that offers a complete solution for capture, output and editing of DV (Digital Video) signals. Equipped with Sony's DVBK-1 hardware DV codec, a breakout box and Ulead's Media Studio Pro 5.0, the DVReX-M1 provides real-time capture and output of DV signals from your camera or VCR via the IEEE1394 port, or converts any analog video and audio to DV. The system also includes ReX Edit software so you can control your DV camera or deck, batch capture video and audio, add new audio tracks and scrub in real-time. DV editing has never been so fast, easy and flexible!



Hardware Features:

- High quality, scalable video windows displays real-time, full-screen video during capture, editing and output.
- During analog capture and output, video characteristics like brightness, contrast, saturation etc. can be manually set.
- When incorporating effects, an optimized hardware DV codec cuts rendering time up to 25%.

ReX Edit Software Features

- Manual and Batch Capture:
- Capture up to 20 minutes (4GB) into one AVI file
- Seamlessly capture long DV segments in one pass (over 20 minutes)
- Capture audio from single or multiple DV channels if desired
- Frame accurate camera control when defining a batch list of video clips
- When batch capturing, camera automatically seeks to clips
- Batch clips can be stored in one or multiple AVI files

- Unique DV breakout box can be used either externally or internally in a 5-1/4" drive bay. The box features composite and S-Video input/output, DV input/output and analog stereo input/output. With the optional M2 module it can also output component video signals and input/output digital audio signals (RCA and optical).

Editing:

- Easy to use drag-and-drop interface with audio and video timeline.
- Manually scrub through the timeline using a Microsoft IntelliMouse
- Real-time video insert and audio scrubbing
- Video can be output directly from the timeline with seamless playback
- Works together with Ulead's MediaStudio Pro 5.0 (bundled with DVReX-M1) for effects and titling

Multi-Channel Audio Input and Output with Mixing:

- Capture and output native DV multi-channel audio
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- Genlock using separate sync input for working in professional video suites
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MCXpress Features:

- The ideal tool for video and multimedia producers who require predictable project throughput and high-quality results when creating video and digital media for training, promotional/marketing material, local television and cable commercials, CD-ROM and Internet/intranet distribution. Based on Avid's industry-leading technology, it combines a robust editing functionality with a streamlined interface. Offers integration with third-party Windows applications, professional editing features, powerful media management, title tool and a plug-in effects architecture. It also features multiple output options including so you save time and money by reusing media assets across a range of video and multimedia projects.

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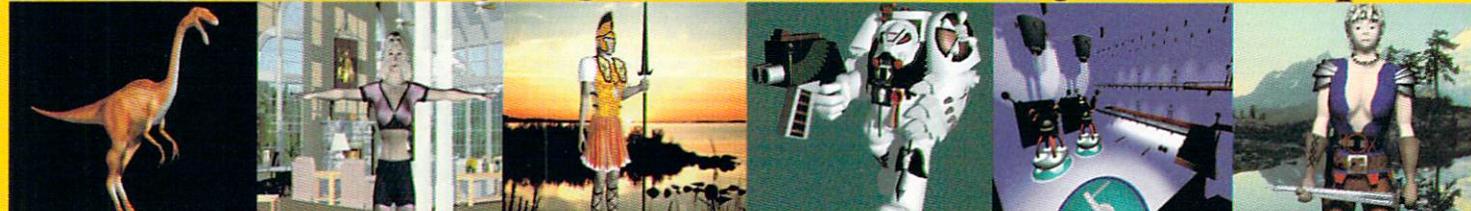


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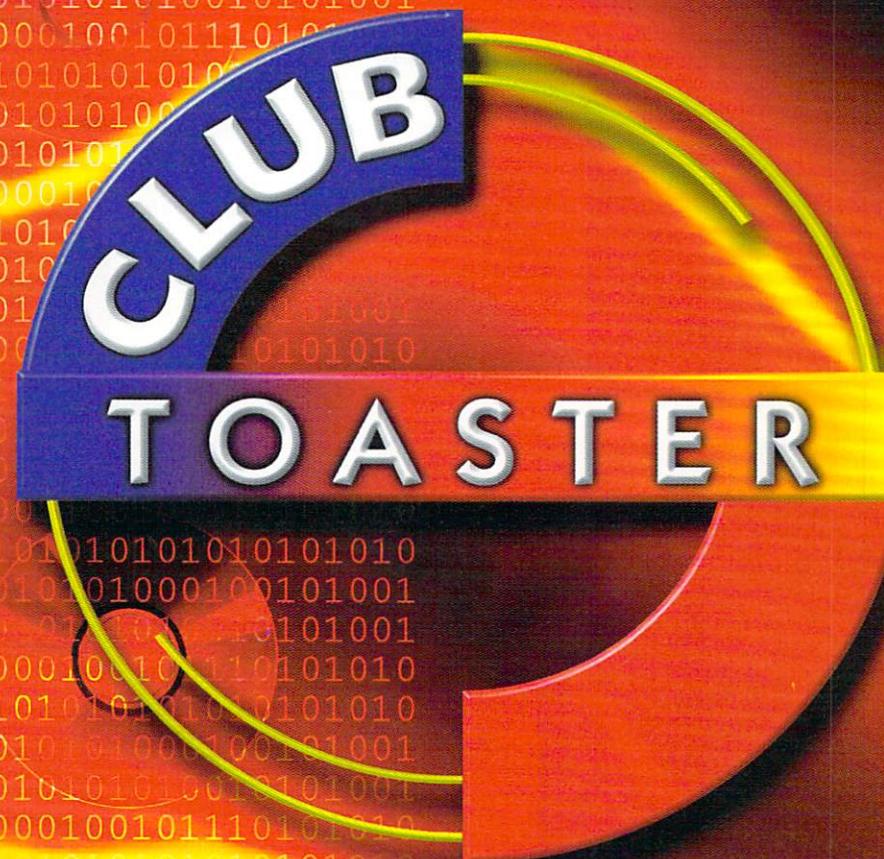
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William Jasper Winans — "Nautilus"

Software: LightWave 3D 5.5, Photoshop 5.0

Description: This example demonstrates an underwater lighting effect. On the first pass, the underwater shadows are created by shining a spotlight source through an object with a moving clip map surface. The Nautilus is rendered (Alpha) to superimpose it over the second pass. In the second pass, Crumple's surface is used for the ocean surface.

email: wjwinans@apk.net

Phone: 216-241-0025



David Northcutt — "Samurai Study"

Software: LightWave 3D 5.0, Photoshop

Description: This is a Samurai character I created based on historical drawings. It was modeled and rendered in LightWave 3D 5.0. The textures were created with Photoshop.

email: dnorth@linex.com

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Erwin Gómez Viñales — "Vampire"

Software: LightWave 3D 5.5, Photoshop

Description: This image is part of short film "The Lord of Sipán," based in Moche iconography.

email: egomez@ctcreuna.cl

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Winning Isn't Everything If You Say It Over and Over You Just Might Believe It

A few short days ago, I had the privilege of attending the 50th Annual Emmy Awards. No, it wasn't the big prime-time Emmy Awards you see on TV; this was the "Creative Arts Awards," or more popularly known (at least in Hollywood) as the Technical Emmy Awards. On this night, the accomplishments of behind-the-scenes folks are acknowledged. The honors go to categories such as "Best Editing," "Best Sound Design," "Best Dry Weather Groundskeeping Near A Television Studio" and last, but not least, "Best Visual Effects."

A good sign for us is that all the nominated programs used digital technology to create their outstanding achievements: "Star Trek: Deep Space Nine;" "Stargate: SG-1;" "Suddenly Susan" (Brooke Shields was placed into old movies à la *Forrest Gump*); "Yo Yo Ma: Inspired by Bach" (the acclaimed cellist played inside a computer-generated medieval castle); and last, but not least, "Star Trek: Voyager."

It certainly is a sign of the times when sitcoms and classical musicians have a stake in visual effects. The practicality of computer graphics is definitely having a creative impact in the least likely of places; the technology to let your imagination run wild is no longer in the hands of a select

few! This is great news, since it means that everyone reading this can rest assured that there are still plenty of jobs waiting for them in Hollywood. Who knows? Maybe one day *you'll* get nominated for an Emmy—just like me!

And maybe the science-fiction program you bust your ass creating stunning visuals for will lose to...well, let me tell you the story.

Now, faithful readers, don't assume that I went to the awards ceremony with an enormous ego convinced that we were going to win. In all sincerity, I believed the Emmy would go to the "Deep Space Nine" episode "One Little Ship," which featured effects that were a wonderful departure from standard sci-fi fare. I didn't think "Stargate" would win because it's

on Showtime and no one even really knows it exists. And "Suddenly Susan?" Gimme a break! After all, the show doesn't even have a colon in its name. As for our friend with the stringed instrument...well, I had heard the "Yo Yo Ma" special was good, but having not seen it myself it was hard to guess at its chances of winning. But still—"Yo Yo Ma?" Some folks didn't think it even belonged in the visual effects category, so I decided it was too far out of left field to stand a chance. As far as I was concerned, it was between us and "Deep Space Nine." So, patiently, the visual effects crew from "Voyager" sat together and waited, nervously pondering what form of celebration would transpire if the unthinkable happened.

After what seemed like an eternity, our celebrity presenter (the esteemed Alan Young from "Mr. Ed") ripped open the envelope.

I squeezed my date's hand tightly. *And the winner was... "Yo Yo Ma." What?!*

In actuality, my brain didn't believe what it heard. It wasn't until everyone around me started crying "Yo Yo Ma!?" in disbelief that I understood what had just happened. A cellist beat out "Star Trek" for "Best Visual Effects."

Now, dear friend, let me hand out a piece of free advice to whomever this may apply—if you're ever nominated for an award and end up going to a big presentation ceremony, make sure

If you're ever nominated for an award and end up going to a big presentation ceremony, make sure you get a seat right next to the exit.

BY MOJO

you get a seat right next to the exit. Why? Well, if you think it's tough to watch an awards show all the way through, just try being there for another hour-and-a-half after you lose.

Don't get me wrong—I'm not trying to sound bitter—but if one more person says, "Well, it's still a great honor to be nominated," my eyes are going to roll so far back into my head that I'll be able to count my teeth. Yes, it is nice to have been nominated, but you know what? Holding that golden statue over my head while I stand through the moon roof of a limo drunkenly shouting, "I'm number one" would have been nicer.

Of course, I know that all of us did excellent work on the "Year of Hell" episode for "Voyager." Not winning the Emmy doesn't change that. I'm still damn proud of the work that everyone at Foundation Imaging has done since we started the show. But I also know that, right now, John Gross is laughing his ass off!

We're all taught in so many ways to strive to be the best. I don't think any of us got into this business to win an Emmy, and certainly it's not a motivating factor in our day-to-day work. The fact that we like animating and we're working for the show we grew up on is a much bigger payoff than any hunk of metal could ever be. At least that's what I keep telling myself!

Mojo is a senior supervising animator at Foundation Imaging. He wants to thank John Teska, Emile Smith, and Koji Kuramura for contributing to the Emmy nomination, and his date Kim for still going out with him.

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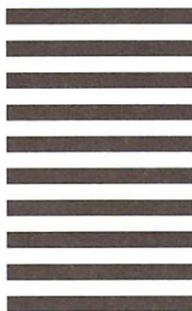
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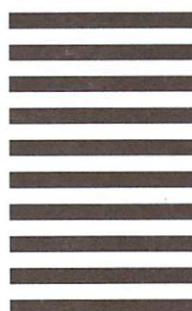
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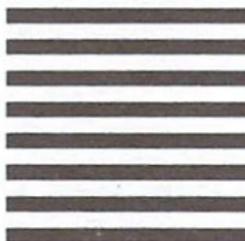


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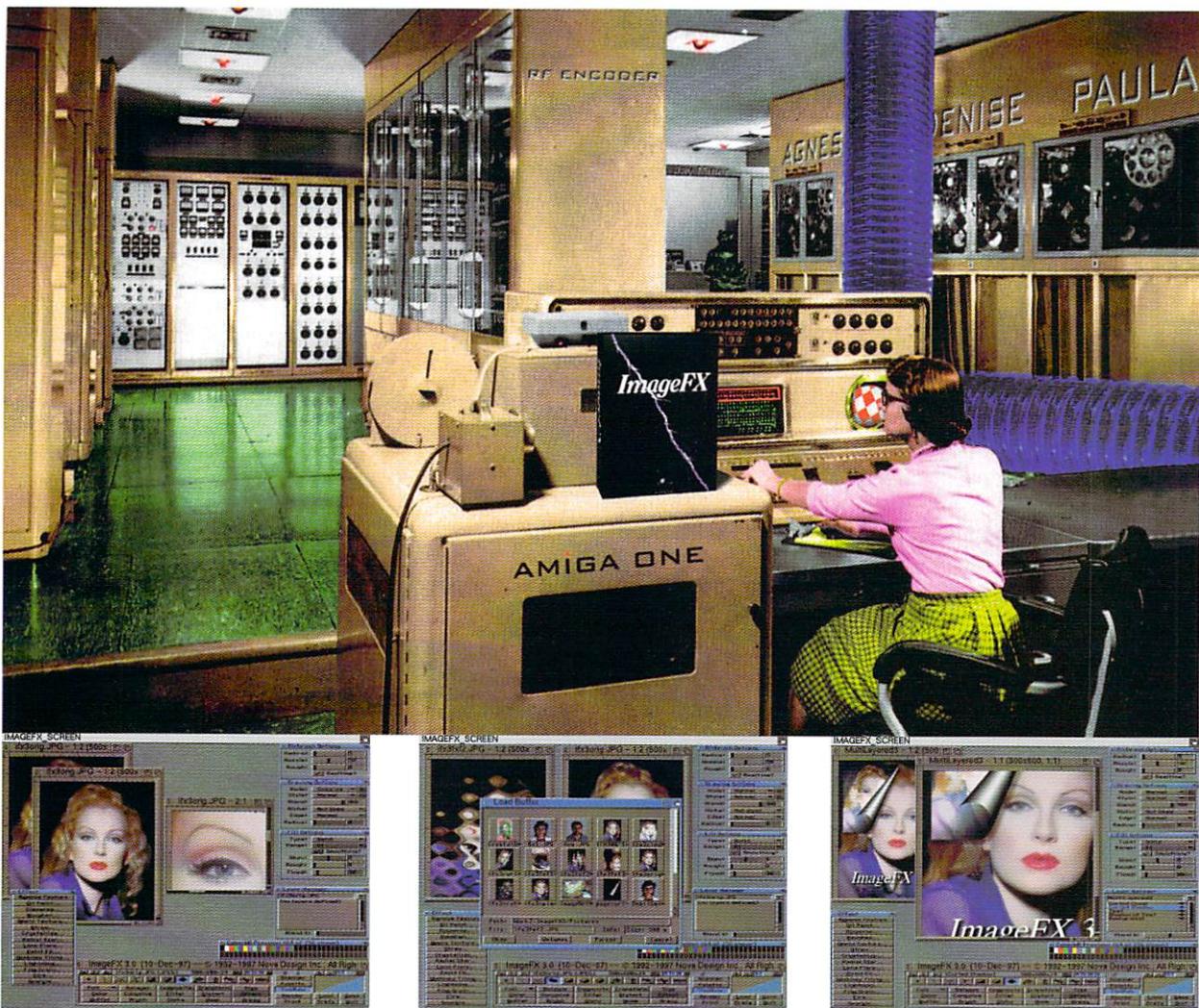
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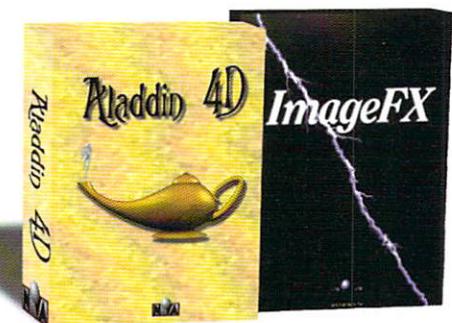


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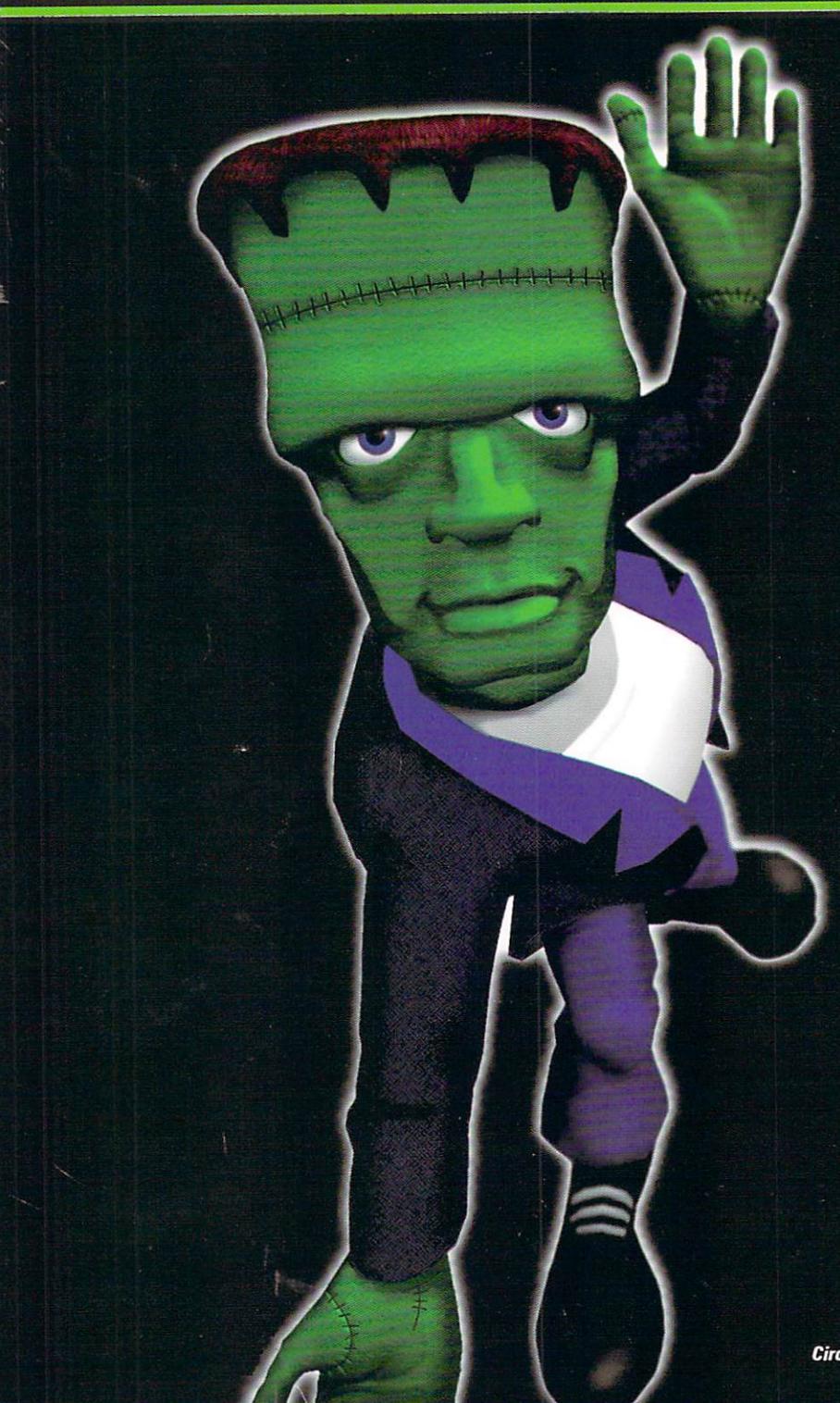
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